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THE
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JANUARY, 1855.  
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ON *JEFFERSONIA DIPHYLLO*. (TWIN LEAF—RHEUMATISM
ROOT.)

BY EDWARD S. WAYNE.

Nat. Ord.—Berberidaceæ. *Sez. Syst.*—Octandria monogynia.

The *Jeffersonia diphylla* is a herbaceous annual plant ; the scape or stem is naked, from eight to fourteen inches high ; the leaves are in pairs, binate, placed base to base ; oval broader than long, ending in an obtuse point, smooth, glaucous beneath, and on petioles as long as the scape, which arise from the rhizoma. The flowers are large, regular, white. The calyx consists of four deciduous sepals. Stamens eight, with oblong linear anthers on slender filaments. Ovary ovoid, soon gibbous, pointed ; stigma two lobed. The capsule is obovate, stipitate, one celled, opening half way round horizontally, making a persistent lid. Seeds many on the lateral placenta, with a fleshy lacerate aril, on one side, oblong. (I am indebted to the American Eclectic Dispensatory for the botanical description of this plant.)

The root, which is the part used, is a thick, knotty, rhizoma, from which long fibrous roots proceed ; it is of a brownish yellow color. The epidermis is somewhat corrugated, and in some specimens transversely cracked. The bark is resinous, and contains the active principles of the root. The central portion is ligneous, of a light straw color, and possesses little or none of the bitter acrid taste of the bark, from which it is easily separated by bruising the root. The root, when chewed, has a bitter mucilaginous taste at first, but after a short time an acrid taste, leaving a peculiar irritating sensation in the fauces, similar in some respects to senega. This plant is indigenous to North America, is found in New York, Maryland, and in Virginia, and in many parts of the Western States. My attention has been at-

tracted to this article for some time past, by many encomiums I have heard upon it by physicians of the Eclectic school, as an expectorant and tonic, possessing properties similar to those of senega, which article has become so scarce of late in our market, and consequently high in price, I have been induced, with the view of substituting for it, or bringing into notice and use, an article of similar medicinal properties, which can be obtained plentifully, at a much less price, to make an examination of the chemical constituents of this plant, by means of a proximate analysis.

CHEMICAL EXAMINATION.—One thousand grains of the root in coarse powder was macerated with water for twelve hours; then placed in a percolator, and half a pint of liquid obtained; it was of a dark sherry color, slightly bitter and acid to the taste, (but not as acid or irritating as the root when chewed.) The presence of albumen in this infusion was indicated by its coagulating upon being heated, and yielding precipitates upon the addition of a solution of tannic acid and corrosive sublimate.

Tannin.—Solutions of tartar emetic and gelatin produced no change in the infusion. Sesqui salts of iron produced a marked difference in it, changed the solution to a dark olive green color, unchanged by heating it, and in the course of a short time gave a precipitate of an olive green color, indicating that the color produced by the addition of the sesqui salts of iron was not owing to the presence of gallic acid, but to the presence of a modified tannic acid, which strikes a green color with iron.

Gum.—A portion of the infusion freed from tannic and coloring matter by neutral acetate of lead, gave, upon the addition of basic acetate of lead, a precipitate of gummy matter.

Starch.—A portion of the dregs left in the percolator, was boiled with water, to the filtered liquid tincture of iodine was added, which struck the deep blue color, characteristic of the presence of starch.

Pectin.—The remaining portion of the dregs left was heated for some time with a dilute solution of carb. soda, the liquid filtered off, which upon the addition of chlorohydric acid produced a gelatinous precipitate, pectic acid.

Fatty Resin.—Five hundred grains of the root in coarse powder

was digested with ether for some time, and then placed in a percolator, and about eight ounces of tincture obtained; it was of a dark green color, of a disagreeable astringent taste, and left a permanent greasy stain on paper. A portion of it was soluble in water, the solution gave, with sesqui salts of iron, an olive green color and precipitate, indicating the presence of tannin.

One thousand grains of the root in coarse powder was digested in water for twelve hours, and then placed in a percolator, and water added until thirty two ounces of infusion was obtained; the infusion was of a pale brown color, possessing the odor of the root, and a peculiar acrid taste. Neutral acetate of lead was added as long as it produced a precipitate, and afterwards sub-acetate of lead. The excess of lead being carefully removed by the cautious addition of sulphuric acid, the sulphate of lead was filtered out of the infusion. The liquid was then carefully evaporated to a syrupy consistence (about two ounces remaining); it was to the taste slightly bitter, with none of the acidity of the original infusion. After standing for a day or two, a slight granular precipitate formed at the bottom of the dish: the precipitate was removed and washed with alcohol, in which it was insoluble, also in water, and upon examination was found to be a salt of lime, probably sulphate. The liquid from which the crystals were removed was then evaporated to the consistency of an extract, and treated with boiling alcohol, which dissolved a portion of it, and which was set aside to evaporate spontaneously; upon cooling it assumed a clouded appearance, and left, upon evaporation, a muddy deposite, evincing no disposition to assume a crystalline form. The portion left after treatment with alcohol dissolved readily in water; it had a sweet, slightly bitter taste; evaporated and heated strongly it was decomposed, emitted the peculiar odor of burnt sugar, and like it dissolved in water with a deep brown color.

5000 grains were digested with alcohol for twelve hours, and then thrown into a percolator, and thirty-two ounces of tincture obtained; it was of a dark color, and possessed the peculiar taste of the root to a much greater degree than the former infusion; it was evaporated to a syrupy form and then thrown into warm water, which caused a separation of resin and fatty matter, which was

separated by filtration. To the filtered liquid, hydrochloric acid was added, which caused a slight precipitate to fall; it was separated and washed on the filter, and dissolved in boiling alcohol, from which it separated on cooling, and upon the evaporation of the alcohol assumed an amorphous shape. The amount obtained was so small that I had not sufficient of it to examine it as I should have wished, and shall take another opportunity of examining it; it had a peculiar bitter taste, was soluble in water and also in boiling alcohol, from which it was deposited upon cooling.

I deemed it useless to make any further search for an alkaline principle, aware that of plants of the order Berberidaceæ, so far as they have been examined, none has been found, unless berberine may be classed as such, which is doubtful; it forms compounds with acids, (not true salts,) soluble with difficulty. I consequently turned my investigations to the isolation of the peculiar acrid principle of the plant, upon which its medicinal properties depend, and some further investigation of its peculiar tannic acid. And with this view 5000 grains of the root were digested with alcohol for twenty-four hours, then placed in a percolator and treated with alcohol until it passed almost tasteless; the tincture was of a dark brown color, it was evaporated to a syrupy form, and water added; the fatty and resinous matter separated by filtration; to the filtered liquid neutral acetate of lead was added as long as it produced a precipitate; the precipitate was collected on a filter, washed, and decomposed under alcohol by sulphuretted hydrogen, the liquid heated to expel the excess, and filtered to separate the lead. In its behaviour with re-agents it gave the same results as the tannic acid of *Asperula odorata*, which has been examined by R. Schwartz, (see Chem. Gaz., No. 224,) and strikes with sesqui salts of iron a dark green color; alkalies cause the liquid to assume a brown red color, which by exposure and absorption of oxygen becomes finally opaque and blackish brown. Albumen, gelatin and tartar emetic produced no precipitates. Peroxide of copper caused a dark green color, and both the neutral and the basic lead salts caused yellow precipitates. I would here take the occasion to ask the question is not the appellation of tannic to acids of the behaviour to reagents mentioned a misnomer? The most characteristic reaction of tannic acid is that of forming a precipitate with gelatin, or of combining with it in the process of tanning, forming leather. We

have at present a number of astringent acids called tannic, which, like gallic acid, produce no precipitates with gelatin, nor combine with it. Would it not be more appropriate, and give a better idea of their reactions, to style them gallic, instead of tannic acids ?

Another portion of 5000 grains was treated like the former, *i. e.* a tincture made and evaporated to the consistency of a syrup, and treated as in the preparation of polygalic acid. It was washed well with ether to remove tannic acid, and then dissolved in water and filtered ; to the filtrate, solution of subacetate of lead was added in excess, the precipitate collected on a filter and washed with water. The precipitate suspended in water was decomposed by means of sulphuretted hydrogen, filtered from the sulphuret of lead, the solution evaporated, and the extract exhausted with spirits, and evaporated. The mass left after evaporation was of a light yellow color, transparent, and easily pulverizable, soluble in water, soluble in alcohol, from which solution it was precipitated by the addition of ammonia, and yields precipitates with metallic salts. To the taste it was acrid and nauseous. I have tried the effects of its administration upon myself with decidedly unpleasant results ; both times I tried it, it produced vomiting and a sensation of nausea for some time after. It is, I presume, the acrid principle of the root, and in some of its properties, as far as my knowledge extends, it is similar to polygalic acid, as described in the various works on materia medica.

Both the watery infusion and alcoholic tincture of this root possess, to a very great degree, the property of frothing upon agitation, or upon being poured from one vessel to another. In this respect it resembles senega ; and the isolated acrid principle in solution has this property, which is also characteristic of polygalic acid and saponin, a principle obtained from *Saponaria officinalis*.

The resin left upon the filter, in the examination of the tannic acid, was well washed with water ; in the finely-divided nascent state it was of a light yellow color, and bland to the taste. In drying, the mass contracted very much, and assumed a dark brown color, and a resinous fracture. It was perfectly soluble in alcohol.

From the above experiments upon the root of this plant, its organic constituents found are, albumen, gum, tannic acid, of the

kind that yields no precipitates with solutions of gelatin and tartar emetic, and produces, with sesqui salts of iron a green color, starch, pectin, fatty-resin, resin, sugar, lignin, a peculiar acid resembling polygalic acid, and a bitter principle which I have not had time to examine fully.

INORGANIC CONSTITUENTS.—2000 grains of the bark in coarse powder were partially incinerated in a Hessian crucible, then transferred to a platina one and the incineration completed. Fifty-three grains of ash were obtained. The ash was treated with boiling distilled water as long as it dissolved any portion of it, and the solution then evaporated to dryness, redissolved in water and neutralized with nitric acid, with evolution of carbonic acid.

A portion of the solution was then evaporated to dryness; it had the cooling taste of nitrate of potassa, and deflagrated upon being thrown upon glowing coal. The remainder of the solution was then treated with tartaric acid, which caused a white crystalline precipitate; bichloride of platina produced a yellow deposit, and nitrate of baryta a white precipitate insoluble in nitric acid. These tests indicating that the soluble portion of the ash contains both carbonate and sulphate of potassa.

The insoluble portion of the ash was now treated with dilute hydrochloric acid, the greater portion of the ash was dissolved, with escape of carbonic acid. The solution was filtered, and the insoluble portions upon the filter washed with water. The solution was then evaporated to dryness and dissolved in water. Oxalate of ammonia was added to a portion of it, which threw down a white precipitate of oxalate of lime. Sulphuric acid also threw down a white precipitate, sulphate of lime. To another portion ferrocyanide of potassium, which gave the characteristic blue color indicating the presence of iron. To the remaining portion phosphate of soda was added, which gave the solution an opaque appearance; upon the addition of ammonia to it, a white precipitate was produced, indicating the presence of magnesia.

The insoluble portion of the ash left after treatment with dilute hydrochloric acid was then treated with strong hydrochloric acid, with heat. A small portion of the ash was left undissolved, silica. To the solution ammonia was added, sufficient to neutralize it, and then acetic acid; a gelatinous precipitate formed of

phosphate of sesqui oxide of iron, which was separated, dissolved in muriatic acid from which potassa in excess threw down a red precipitate, sesqui oxide of iron.

The analysis of this root shows that its chemical composition is somewhat similar to that of senega, and its sensible properties are somewhat analogous: like it, it possesses an acrid principle (the identity of which I do not pretend to say) upon which its expectorant property depends; it is, in large doses, emetic, and also has tonic properties. It has been used to some extent in place of senega with satisfactory results, by physicians of the Eclectic school.

Senega, like many other of our indigenous medicines, is becoming every year much scarcer. In localities from which, a few years since, we received a large amount, the plant has become so scarce that it will not pay to collect it. If some other plant possessing similar properties could be substituted for it, the *Jeffersonia* for instance, it would reduce the demand for senega, and allow some opportunity for its increase. As it is, a few years demand for it will, in all probability, make the article so scarce in our markets, and consequently so high in price, that it will be but little used, and in this view I think the *Jeffersonia* is worthy of the attention of the medical profession.

Cincinnati, Nov., 1852.

ON TEXAS SARSAPARILLA.

(*Menispermum Canadense*.)

By ROBERT P. THOMAS, M. D.

In the January number of this Journal for 1844, an account is given by Dr. Joseph Carson, of an article that had recently been brought from New Orleans, and offered for sale in this city, under the name of Texas Sarsaparilla. The following is the description of the article in question. "The packages have been made to resemble those of the genuine, about a foot and a half in length, and half a foot or more in diameter; composed of long branching stems, doubled twice or thrice upon themselves, without any attachment to a head. The lower portion of the stem is as thick as a large sized quill, rough, wrinkled longitudinally, and of a dirty brown color; the upper extremely thin, smooth and light brown

At irregular intervals of their length, are protuberances from which lateral branches appear to have been separated; and along the entire under surface of the older and lower portions are minute fibrillæ, here and there collected in small tufts. The structure of this article is evidently cauline, consisting of a delicate epidermis, and a thin woody layer, very tough and fibrous, enclosing medulla."

The timely publication of the foregoing description, has probably prevented the further introduction of this drug as a substitute for the true sarsaparilla, since but a single importation has been made.

The real source of the article remained in question, until an accidental circumstance, which occurred during the past summer, threw some light upon it.

A member of the Pharmaceutical class, Mr. J. Clarkson Griffith, resolved upon analyzing, as the subject of his Thesis, the root of a plant found growing in great abundance in Virginia; and said to be used by many rural practitioners there as a substitute for sarsaparilla.

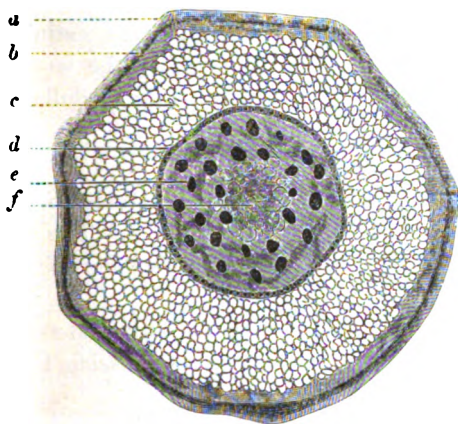
Having received from his friends a package of the roots, containing a few leaves, (but no flowers or fruit,) it was submitted to my inspection to determine the name of the plant. From the peculiar shape of the leaf, its sub-coriaceous and peltate character, and the insertion of the petiole near the margin, I had no difficulty in recognizing it as belonging to the *Menispermum Canadense*, (Moon Seed or Yellow Root.) But as I was struck with the close resemblance between the root and the specimen of Texas Sarsaparilla deposited in the College cabinet, I procured some of the fresh plant and root with a view of instituting a microscopical comparison, and determining, if possible, the true source of the Texas Sarsaparilla.

When the root is freshly-gathered, it is round, smooth, of a bright yellow color, and affords origin to numerous radicles. But after desiccation, it is wrinkled longitudinally, assumes a darker hue, and ultimately becomes brown. It is without odor, the taste is quite bitter and disagreeable. The root is a rhizome or underground stem, but so clearly resembles an aerial one in its structure as to be readily mistaken for the latter. It is divisible into a bark, cortical layer, ligneous fibres, and medulla or pith.

The first point in the inquiry about to be instituted, is to determine that the Texas is not a true sarsaparilla; and the second, to ascertain its identity with the common moon seed, or *Menispermum Canadense*.

To resolve the first question, we must examine the structure of the true sarsaparilla, (*smilax*), and learn what are its component parts, and how they are arranged.

Fig. 1.



The accompanying wood-cut, (Fig. 1,) is a highly magnified representation of the appearance presented by a transverse section of *Para sarsaparilla*. It exhibits a very close resemblance to the diagrams of Honduras and Jamaica sarsaparillas given in Pereira's *Materia Medica*; thereby showing that neither differences

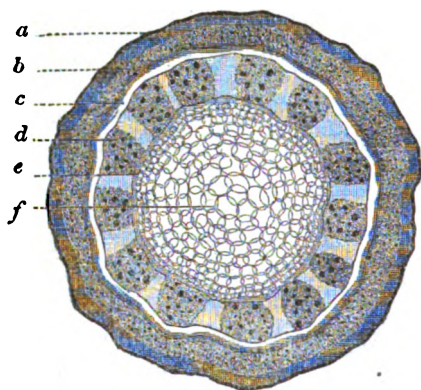
in the mere species of plants, nor yet in the character of the soil and climate where they are produced, effect any very decided changes in their internal structure.

At *a* is seen the thin epidermis, covering *b* the outer cortical layer; *c* is the inner cortical or starchy layer; *d* is the cellular sheath dividing the cortical from the woody layer *e*, in which the cut orifices of numerous ducts and fibres are observed; *f* the central pith.

In this, as in the false sarsaparilla represented below, the four divisions of bark, cortical layer, ligneous fibres and pith are seen. But nothing like a medullary ray (or the silver-grain, as it is usually termed in the stems of plants,) is to be observed. Owing to the presence of the ligneous fibres, represented in section in the woody zone *e*, the true sarsaparilla readily splits in the longitudinal direction.

Figure 2 presents a cross section of the Texas Sarsaparilla which differs in its whole structure from the genuine.

Fig. 2.



a, the epidermis; *b*, the outer cortical layer; *c*, the liber or inner bark; *d*, a zone of ligneous fibres, which are separated from each other by a medullary deposit, the dark spots are the ducts which have been cut across; *e*, the cellular sheath dividing the woody zone from *f*, the medulla or pith.

When the end of the dried root is bruised, it separates into a brush, consisting of the ligneous fibres of the zone *d*. The appearance presented is entirely different from the simple longitudinal splitting of the true sarsaparilla.

The structure of this rhizome is evidently that of an aerial stem, containing bark, wood and pith; with medullary rays passing from the pith to the bark.

An examination of these figures affords us conclusive evidence of the structural difference between the true and false sarsaparillas, and thus determines the first point in the inquiry.

To resolve the second, or in other words, to ascertain, if possible, from what plant the Texas Sarsaparilla was derived, I examined, microscopically, the root of the plant brought from Virginia, (which I judged to be the *Menispermum Canadense* from the nature of its leaf,) and found it to correspond in every particular with the representation given in figure 2.

The next examination was of a specimen of "yellow parilla," the name given to the root of the *Menispermum Canadense* by the Eclectics; and this, also, coincided in its characteristics with those shown in figure 2.

Lastly, I procured fresh specimens of the root, which upon inspection exhibited similar appearances. In fact, I could detect no structural differences between the Texas Sarsaparilla, the Virginia Sarsaparilla, the "yellow parilla," and the fresh root of the

Menispermum Canadense, when sections of each were placed on the field of the microscope. The conclusion was irresistible to my mind, that the so-called Texas Sarsaparilla is the root of the common moon seed or *Menispermum Canadense*.

Philadelphia, Nov. 1854.

ON THE ADVANTAGES THAT WOULD ACCRUE TO ENGLISH
AND AMERICAN PHARMACY BY THE ADOPTION OF A SINGLE
UNIFORM PHARMACOPŒIA FOR THE BRITISH EMPIRE.*

By FRANKLIN BACHE, M. D.

Professor of Chemistry in Jefferson Medical College of Philadelphia.

A difficulty which medical students have to contend with, and which is the more to be regretted, because it does not necessarily attach to science, is to be found in the numerous synonymes in use in the various sciences connected with medicine. We have them in botany, in chemistry, in the *materia medica*, and especially in the nomenclature of pharmaceutical preparations. The pharmacy of this country, before the year 1820, when our first national Pharmacopœia was published, was derived from Great Britain, which furnished us with three standards of pharmaceutical preparations; namely, the London, Edinburgh and Dublin Pharmacopœias, emanating from the Colleges of Physicians of those cities. In that year, our national Pharmacopœia came into use as a standard; and by its several revisions in 1830, 1840 and 1850, it has been rendered more and more acceptable to the medical and pharmaceutical professions. Still, our national work could not be expected entirely to supersede the British Pharmacopœias; and, accordingly, it will be found that all the Dispensatories, published in this country since 1820, have not only elucidated the United States Pharmacopœia, but included a commentary on the British works. The course, thus taken by commentators, was a proper one. Our national Pharmacopœia could not be expected to include the whole of the *materia medica* and preparations of the British standards, a part of the matter of the three works being peculiar to each; and yet the articles omitted deserved to be commented on by our pharmacologists, either on account of their lingering

*Extracted from an unpublished introductory lecture, delivered Oct. 12, 1854.

reputation, or in view of their being frequently referred to in valuable medical works of English, Scotch and Irish authors. So long, therefore, as we give the attention to the medical literature of Great Britain that it deserves, we must make ourselves acquainted with the officinal medicines and preparations, stamped as of value by the authority of her Colleges; otherwise her medical writers would be, to some extent, unintelligible to us. It is thus clearly shown that we are necessarily interested in British pharmacology, and in those meliorations of which it is undoubtedly susceptible. But the pharmacology of Great Britain is mainly embodied in her three Pharmacopœias, each emanating from an authoritative body; while, evidently, there should be but one standard for the whole British empire. The evil of this want of uniformity is put in a striking point of view, by supposing that each State of our union had a separate Pharmacopœia; but the evil is the same in kind, only less in degree, that a separate Pharmacopœia is recognized, severally, in England, Scotland and Ireland.

By the more enlightened nations of continental Europe, the interests connected with the preparation of medicines are better guarded; as in France, for example, where but one standard of pharmacy is allowable by law for the whole empire; and this standard is the result of the joint labours of a commission of physicians and pharmacutists, appointed by the government. The evil of the British system is admitted by British medical writers; and the reform is delayed, not because it is deemed unnecessary, but because the Colleges cannot agree upon a single standard, chiefly on account of their local prejudices and mutual jealousies. The British Pharmacopœias contain a body of identical or equivalent medicines and preparations, which form the common basis of the three works. In relation to these medicines and preparations, it would be necessary to agree upon a uniform nomenclature, and upon uniform formulas. This agreement being effected, it would next be a question in relation to the medicines and preparations peculiar to any two or any one of the Colleges; and the nomenclature and formulas of these should be made to conform in principle with those of the common basis. No College could reasonably object to the retention of any medicine or preparation, advocated by any other College; because, although the article may be uncalled for in the

region under the influence of the objecting College, still it would be merely surplusage to such College ; while it might be necessary to meet the wants of the physicians in the region under the influence of the advocating College. The prejudices and conflicting interests, shadowed forth in these remarks, would make it extremely difficult, not to say impossible, to get the British Colleges to agree on all points in relation to a common standard. The most that could be expected from them, would be to settle the general principles of the work, and to take some steps of detail in the right direction. To make a final disposition of the subject, it would, no doubt, be necessary that the law should interpose ; and that, by authority of an act of parliament, a commission of eminent men should be clothed with full power to dispose of all outstanding questions, and to complete the desired standard. If a course, somewhat like that here indicated, were taken, the advantage would accrue to medical science of having not merely one, instead of three British Pharmacopœias ; but of having the elaborated work incomparably superior to those it would supersede. Many anomalies and inconsistencies of British pharmacy would disappear ; dangerous variations in the strength of officinal solutions of the salts of morphia would no longer exist ; and those glaring defects in nomenclature, consisting in calling the same preparation by different names, and different preparations by the same name, would be removed. Our national Pharmacopœia would feel the benefit of such a reform ; for, without doubt, if such a Pharmacopœia of the British empire were published, all the new and valuable parts of it would be incorporated into our national standard on its next revision in 1860. Nor is this all. Our physicians and medical students would feel the benefit of the reform. British medical works would employ a uniform nomenclature for medicines ; and our Dispensatories would be relieved from a number of discordant formulas, and from a load of useless synonymes, which at present form a most discouraging obstruction to the progress of the student.

ON A SUBSTITUTE FOR TAR BEER.

By B. J. CREW.

Having, in common with many Pharmaceutists, experienced considerable difficulty in procuring at once both a neat and reliable

preparation of tar, by the ordinary formula for Tar Beer, I was induced to try another more expeditious and much less troublesome and disagreeable mode, than the old plan of using bran, honey and some ferment, and having, as I think, entirely succeeded, I have been induced to make the formula known for the benefit of others.

R. Ol. picis liquidæ.	ʒij.
Magnesizæ carb.	ʒij.
Aquæ,	ʒxiv.
Syrup simp.	ʒij.

Rub the oil of tar with the carbonate, add a portion of the water, mix well, then add the balance, filter and add the simple syrup. It is now ready for use, and may be taken in the usual dose of a small wineglassful. As thus made, it has given, as far as I am aware, entire satisfaction, having been in use for several years.

[NOTE BY THE EDITOR.—The above preparation is an elegant substitute for *Tar Water*, but can hardly be considered as a correct substitute for tar beer, inasmuch as other substances besides those contained in oil of tar are taken up; the acetic acid present in tar aids in the solution of the kreasote in this preparation of the beer, whilst a portion of alcohol in the latter adds materially to the solvent action of the menstruum, if the preparation is properly made as described at page 110, vol. 22d, of this Journal.]

REMARKS ON GUM MEZQUITE—A VARIETY OF GUM DISCOVERED BY DR. GEORGE G. SHUMARD, IN NORTHERN TEXAS.

By WILLIAM PROCTER, JR.

For several months past occasional notices have appeared in the newspapers of a species of gum discovered in upper Texas and New Mexico by Dr. Shumard, one of Capt. Marcy's expedition to the Indian country, sent by Government. The following letter from Dr. Shumard, accompanying a package of the gum, will throw some light on the subject:

Fort Smith, Arkansas, Oct. 24, 1854.

DEAR SIR,—Along with this I send you a sample of gum *mezquite*, discovered by myself while upon our late exploration to the head waters of the Big Wichita and Brazos Rivers.

The mezquite tree, from which it was obtained, is by far the most abun-

dant tree of the plains, and covers thousand of miles of surface. From them the gum exudes spontaneously in a semi-fluid state, and hardens in a few hours, forming more or less rounded lumps of various shades of color, and weighing each from a few grains to several ounces. These soon bleach and whiten by exposure to the light of the sun, finally becoming semi-transparent, and often filled with minute fissures.

The quantity yielded by each tree varies from an ounce to three pounds, but incisions made in the bark not only greatly facilitates its exudation, but causes the tree to yield a much greater amount. The gum may be collected during the months of July, August and September, but the most favorable period for that purpose is in the latter part of August, when it may be obtained in the greatest abundance and with but little trouble. By proper care and attention, I am of the opinion that a sufficient quantity may be annually obtained not only to supply the home market, but to admit of a large surplus for exportation. I have employed the gum medicinally in several instances, and find it answers the purpose of the best gum acacia; with water it forms a beautiful mucilage, while for a proof of its great tenacity I will refer you to this package with which it is sealed. I would be pleased to hear from you upon the subject.

Respectfully yours,

GEO. G. SHUMARD, M.D.

Surgeon and Geologist to Capt. R. B. Marcy's Expedition to Brazos and Wichita Rivers.
To CHARLES ELLIS, President of the Philada. College of Pharmacy.

Dr. Shumard, in a letter to Hon. Thos. S. D. Drew, of the Indian Agency, uses the following language, viz:

"SIR,—I cheerfully comply with your request to furnish, for the use of the Indian Department, a short description of the gum mesquite, discovered during our recent expedition to the head waters of the Big Wachita and Brazos rivers.

"This gum, for which I propose the name of gum *mezquite*, is believed to occur in inexhaustible quantities, and will no doubt prove a source of revenue to the State of Texas, New Mexico and the adjacent Indian territory, besides affording employment to the different tribes of Indians now roving upon the plains, many of whom would no doubt be glad to gather and deliver it to the different frontier posts for a very small compensation."

The specimen of gum sent to Mr. Ellis consists of tears of various sizes, and degrees of purity, from colorless to dark amber color. The pieces are much fissured, like the true gum acacia, and even the darkest pieces, when broken, soon exhibit the tendency to crack into fragments. Many of the pieces have particles of bark attached to them. The sp. gravity of the solid lumps is 1.311, which is about the same as that of gum arabic. Put in

contact with water the gum dissolves as completely as the purest gum arabic, without any tendency to swell like cherry gum or tragacanth; and this is true of the dark colored pieces as well as the light, the mucilage being perfectly transparent. The solution has a slightly acid reaction; alcohol precipitates it in white flocks like arabin; neither neutral or basic acetate of lead alone precipitates it, but on the addition of ammonia after the neutral acetate, a bulky gelatinous precipitate is thrown down. This does not occur when the ammonia is added after the subacetate. When the gum is boiled with an alkaline solution of oxide of copper, no reduction occurs indicative of glucose. When powdered borax is added to its solution no coagulation occurs, as with arabin, nor does tersulphate of iron occasion any precipitate. Oxalate of ammonia instantly causes a white cloud in the transparent solution; iodine occasions no change. Concentrated sulphuric acid dissolves it, and when heated chars it.

When heated in nitric acid till effervescence ceases, it affords mucic and oxalic acids, like ordinary gum; exposed to a red heat it swells up, burns, and leaves a bulky greyish-white ash, amounting to 2.1 per cent. of the gum heated. This ash consists of soluble potash salts, (carbonate, sulphate, and chloride) and insoluble lime salts.

From the above results it is evident that gum *mezquite* is not identical with true gum arabic. Its solubility is quite equal to that gum, and is greater than several varieties, which is an important feature in the American product. The mucilage it yields is like the syrupy mucilage of dextrine, and has similar adhesive properties. In its reactions with nitric and sulphuric acids, with alcohol, and with oxalate of ammonia, it resembles arabin, but in reference to basic acetate of lead, borax, and the sulphate of iron, it is entirely different from arabin or any of the gums described that I am acquainted with.

It is to be regretted that Dr. Shumard has made no allusion to the botanical origin of this gum, a point on which he must certainly have informed himself. There are several species of acacia indigenous to that region, and botanists here believe it is probably attributable to one or more of these. Its abundance and easiness of collection, if corroborated in practice, may prove important hereafter, as an addition to our internal national re-

sources, yet the quality of the gum, as regards freedom from extraneous matter, and color, will have to greatly improve before it will compete with the foreign gum as a medicinal agent. It remains to be seen what effect greater care in collection and garbling, and in subsequent bleaching, will have in its improvement.

Since the above was in print, my friend, E. Durand, informs me that the Mezquite tree of Dr. Shumard, is probably either the *Strambo carpa pubescens* or screw pod mimosa, (Gray,) or the *Algarobia glandulosa*. The former is a small tree, from 6 to 12 feet in height; the latter 20 to 30 feet, and described as being abundant on the plains of Western Texas. They both belong to the *Acacia* family, and are armed with prickles. Dr. Gray gives no hint in reference to their gum-bearing quality, which may be due to the botanical collections being made at a season earlier than that stated by Dr. Shumard, as favorable to the exudation of the gum. (See *Plantæ Wrightianæ*, No. 1, Smithsonian. Contrib. 1852.)

At page 268 of Redwood's Grey's Supplement, the following statement occurs, which shows that Dr. Shumard is not the original discoverer of this gum, nor of its use instead of gum arabic.

"*Prosopis dulcis* (Kunth,). Mexico. Yields a gum, *mezquitina goma mezquitina*, which is used instead of gum arabic."

Now Dr. Grey refers to *Prosopis dulcis*, in his account of *Algarobia glandulosa*, and thinks they are not synonymous; yet as some doubts seem to exist, the difference between Kunth's *Prosopis* and the *Algarobia* may be due to accidental causes, as it is well known that plants are modified by growth in high land and along water courses. At all events, in the absence of any clue to the name of the plant from Dr. Shumard, we are justified in referring it to *Algarobia glandulosa* or *Prosopis dulcis*.

GLEANINGS—PHARMACEUTICAL, CHEMICAL AND MEDICAL.

Carbazotic acid, (*Picric acid*.) Prof. CRACE CALVERT at the late meeting of the British Association at Liverpool, stated that Dr. Bell, of Manchester, had treated cases of intermittent fever most successfully with carbazotic acid, and he believed it to be

a valuable substitute for quinia. It is easily prepared from carbolic acid, (coal tar creasote,) and Mr. R. Warrington observed, that the acid can be made from the Australian product, called "black gum," by acting on it with nitric acid, at the small price of one shilling sterling a pound.—(*Pharm. Jour.*)

This acid is also formed by the action of nitric acid on indigo, salicine, silk, aloes, oil of gaultheria and other substances. The nitric acid should be fuming and the action assisted by heat. The acid should be purified by solution in boiling water, and crystallization by cooling. This acid forms with potash a slightly soluble salt, and is employed as a test for that alkali.

Carbolic acid. Prof. CALVERT on the same occasion stated that carbolic acid was an excellent antiseptic, and that a bird stuffer of his acquaintance, at Manchester, preserved the skins of birds by merely washing the insides with this acid. It was also used for injecting dead bodies for dissection to preserve them from change. For this purpose the acid is mixed with water, and it was found not to materially affect the appearance of the tissues. Dr. Calvert further stated that in Manchester, carbolic acid can be procured at 50 cents per gallon!—(*Pharm. Jour.*)

Preservation of Milk. At the same meeting, the Abbé Moigno described the following method of preserving both milk and cream sweet and sound for six months. The milk is introduced into cylindrical iron bottles fitted with a leaden tube or neck at top, at the boiling temperature, so as to exclude all atmospheric air, and the neck is then pinched a little below the top so as to effectually close it, after which, the part above the contraction is cut off; by this means every particle of air is excluded, and the agent of decomposition not being present, the milk keeps well.—(*Pharm. Jour.*)

Preservation of flesh meat. It is well known that in the region of South America, which affords the largest supply of hides to commerce, an immense quantity of beef is annually left to decay, after the removal of the hides from the slaughtered animals. The idea of bringing this beef into market having been suggested by mercantile gentlemen of Liverpool, George Hamilton, Esq., undertook a series of experiments, with the view of preserving the meat in a fresh state during its transportation to Europe. The plan adopted, as a basis, was to enclose the flesh in a suitable vessel, and displace the atmospheric air completely,

with some other gas having antiseptic qualities. After trying chlorine, ammonia and others, he found that nitric oxide (NO^2) gas was most efficient. Half a pound of fresh meat was suspended in a glass stoppered bottle, on a spit of wood, and the bottle filled with nitric acid. "At the end of 21 days the color was not changed, there was a faint odor of nitrous acid, and the beef was perfectly fresh and good." From his numerous experiments, Mr. Hamilton concludes, "that nitric oxide preserves beef from putrefaction for at least five months. The meat retains its natural color and consistence almost perfectly unchanged. It is necessary that the proportion of gas to beef should not be below a certain relation, else the meat spoils; and on the other hand, if the quantity of gas is too large, the juices of the meat exude in too large a quantity. Meat preserved in this way, when roasted, is apt to have an acid taste, but when boiled in several waters this is removed. The author believes the injurious action of the gas may be modified by the admixture of nitrogen."—(*Pharm. Jour.*)

Black pepper of Western Africa, Cubeba Clusii, (Miguel.) Dr. W. F. Daniell, (in the *Pharm. Jour.*, for Nov. 1854,) gives a detailed account of this plant, accompanied by a figure. This species of pepper appears to have been known in early Portuguese commerce with Africa, and is produced in the mountainous countries of equinoctial Africa. The plant is climbing, and attaches itself to trees in the forest, flowers in October and November, and the fruit is collected in January, while yet immature. The fruit is borne on an irregular raceme. The dried berries are globose, and have the remains of the stalk attached, which has given them the name of *tailed pepper*. Their taste is camphoraceous, peppery and moderately acid in a fresh state, diffusing a rich aromatic odor, and reminding one of cubebs when chewed, but are more allied to black pepper on the whole.

According to Mr. Hanbury, these berries have been imported recently as African Cubebs. Dr. Daniell is not aware that they are used in Africa, for the purposes to which the East Indian drug is applied.

Mercurial Ointment. M. Pomenti, of Bastia, recommends the use of nitrate of potassa to facilitate the extinguishment of mercury, in making this ointment. A drachm and a half of the salt dissolved in a little water, and mixed with eight ounces of

lard, is triturated with 35 ounces of mercury for a few minutes, and the remainder of the lard added. The mercury is reduced to extreme division in a very short time. What effect the nitrate has in modifying the action of the ointment is not explained by the author.—(*Pharm. Jour.*)

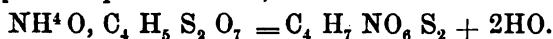
Bin oxide of lead. Wohler states, (*Ann. der Chem.*) that bin-oxide of lead can be readily procured by mixing four parts of crystallized acetate of lead, and three parts of crystallized carbonate of soda in water, and passing chlorine into the mixed carbonate of lead and acetate of soda, until both salts are decomposed with the formation of bin oxide of lead and chloride of potassium. These proportions yield two and a half parts of the bin oxide.—(*Pharm. Jour.*)

Anhydrous Persulphate of Iron. Mr. Peter Hart, of Manchester, England, has discovered a crystallized anhydrous tersulphate of sesqui oxide of iron, in the platinum retorts in which oil of vitriol is concentrated. He traces it to the iron rods coated with lead, which support the covers to the preparatory evaporators. These rods occasionally become exposed, and the acid fumes act on them and cause the formation of a salt of iron, which drops into the acid, and is dissolved to separate from it in the last process of concentration ; several careful analyses proved it to be quite pure. This salt has a pinkish white color, and is slowly soluble in water.—(*Annals of Pharmacy.*)

Artificial preparation of Oil of Cinnamon. M. Strecker, some years ago, ascertained that *Styrone*, the oily liquid obtained by distilling purified storax with potash, was the alcohol of cinnamic acid. He has recently proved that, when styrone is treated with platina black, as in making common aldehyde, the product is pure oil of cinnamon, which is the *aldehyd of cinnamic acid*. The following equation represents the reaction : styrone, $C_{18}H_{10}O_2$, by absorbing O_2 becomes $C_{18}H_8O_2 + 2HO$.—(*Comptes Rendus.*)

Henbane Segars. Dr. Seifert, of Vienna, has personally experienced benefit from the use of segars medicated with hyoscyamus leaves, in some affections of the chest. He directs them to be made from tobacco leaves previously deprived of their acrid principle, and in making each segar, from five to eight grains of powdered henbane leaves is introduced. He has prescribed from 4 to 8 such segars daily.—(*Annals of Pharm.*)

Artificial formation of Taurine. The formula of taurine is $C_4 H_7 NO_6 S_2$. M. Strecker after several courses of experiment to form this body artificially, finally succeeded in making it from the isäthionate of ammonia, which salt contains the elements of taurine, plus 2 equiv. of water, thus



Isäthionic acid is obtained from olefiant gas and anhydrous sulphuric acid, or from the same acid with alcohol or ether. To isolate it, the mixture is saturated with baryta, and the barytic salt precipitated by alcohol, and this decomposed by carbonate of ammonia. The ammoniacal isäthionate crystallizes in rhombic tables. The author found that taurine could be heated to $461^\circ F.$ without decomposition. Isäthionate of ammonia fuses at $266^\circ F.$, and can be heated to 392° without alteration; at 410° , it evolves water; and after being continued at 428° it loses 10 to 12 per cent. and undergoes change, becoming solid and colored. The changed salt dissolves in water readily, and was precipitated from it by alcohol in colorless crystals, possessing completely the crystalline form and characteristics of taurine obtained from bile.—(*Annals of Pharm.*)

How to take Quinine without tasting it. Dr. W. H. Edwards says, that quinine may be taken without tasting its bitterness, by putting the salt in powder in the middle of a tablespoonful of thick mucilage of slippery elm, so as not to touch the spoon, and immediately swallowing it. The mucilage is obtained by macerating several long slips of the bark in a tumbler of water, and after the bark has swollen and become surrounded by mucilage, strip this off into the spoon by drawing the bark between the thumb and forefinger. If the quinine is dextrously enveloped in the mucilage, the patient is unconscious of having taken a bitter dose.—(*Annals.*)

Valerian root adulterated with Scabious root. M. O. Reveil, (*Jour. de Chimie Med.* Oct. 1854.) states that he has detected the roots of *Scabiosa succisa* and *S. arvensis* to the extent of 22 per cent. in the Valerian in the shops of the herborists of Paris. The caudex of the scabious is shorter, truncated at its base; the radicles a little larger and smoother, having but little evidence of longitudinal striæ, are very fragile, fracturing with great facility, presenting a whitish amylaceous surface. These roots are inodorous, but soon acquire the odor of valerian by association.

Strogonoff's tincture for the Cholera. M. O. Reveil, (Jour. de Chimie Med.) has seen prescribed powdered charcoal, a table-spoonful at a time, in the form of injections, in cholera; and at the same time administered the same dose by the stomach.

In the collapsed stage, the same physicians have employed, with success, the tincture of Strogonoff, which has the following composition. Tincture of nux vomica, and tincture of arnica, each *four* parts; ethereal tincture of valerian, and Hoffman's anodyne, each *eight* parts; tincture of aconite, *twelve* parts; tincture of opium, *six* parts; essence of mint, *two* parts; mixed. Of this tincture, 15 to 20 drops in good wine are given in case of coldness and extinction of the pulse.

Opium of Algeria. For about ten years past, the culture of opium in Algeria has been encouraged, in an experimental way, by the French government. Quite recently, the French minister of war, submitted five specimens of Algerine opium to a commission of the Academy, with the following results, as regards the per centage of morphia; viz. No. 1, from the village of Montpensier 9.66 per cent; No. 2, grown at Fouka, 11 per cent; No. 3, from the nursery of the government at Algeria, 11.83 per cent; No. 4, from the central nursery of the government 7 per cent.; No. 5, another specimen from the same, 8.83 per cent.

Iodhydrine. M M. Bertholet and de Luca, (Comptes Rend. Oct. 16, 1854,) have ascertained that glycerin saturated with hydriodic acid gas, and kept for fourteen hours in a close vessel at 212° F., and then treated with potash and ether, yields a peculiar iodized liquid, *Iodhydrine*. It is a syrupy, golden colored liquid, sp. grav. 1.783, insoluble in water, but dissolving a fifth of its bulk of that fluid, soluble in alcohol, has a saccharine taste, is not volatile, but burns without residue, evolving iodine vapor. In its formation, two equivalents of glycerin and one of hydriodic acid, yield one eq. of iodhydrine and 6 of water, thus

$$2C^6 H^8 O^6, + HI = C^{12} H^{11} C_6 + 6HO.$$

The authors think it possible that the iodine contained in cod-liver oil and analogous oils, may exist in the form of iodhydrine, or some similar compound.

ON BENZOIC ACID FROM URINE.

BY THE EDITOR.

Within a few years past, and since the discovery of the ready conversion of hippuric into benzoic acid, there have been occasional importations of benzoic acid from Germany, derived from the urine of horses and cattle, and that which we have seen has been beautifully brilliant in its lustre and whiteness. Hippuric acid appears to be proximately composed of benzoic acid and glycocoll, (or sugar of gelatin), and may be decomposed into these bodies by the action of strong acids. For instance, when hippuric acid is boiled in strong muriatic acid, the acid combines with the glycocoll, and liberates the benzoic acid, which precipitates in crystals by the cooling of the solution. Or the glycocoll may be destroyed by oxydizing agents, and the acid thus set at liberty; or, finally, it may be obtained directly from the urine of the cow or horse by suffering that fluid to putrefy, when the glycocoll base of the hippuric acid is destroyed, and by concentration the benzoic acid crystallizes out. It is probable that the acid made by the latter process is liable to be tainted with an unpleasant urinous odor, (not observable when the urine is evaporated whilst fresh, and precipitated with muriatic acid,) when not carefully purified.

Recently a lot of benzoic acid having this peculiarity arrived at the New York Custom House from a German port, and has been rejected on the ground that it is not derived from gum benzoin, but is made from urine, of which fact its odor would lead to suspicion. Now it is well known that much of this acid has heretofore passed unquestioned, and was in reality purer than much of the commercial benzoic acid from benzoin—the latter having empyreumatic oil adhering, which gives it a strong but rather agreeable odor. It becomes an interesting question whether our examiners are justified in rejecting a chemical substance because it is derived from a different source from that usually indicated in books, or acted on in practice. Undoubtedly, if the benzoic acid in question is condemned on the ground that it has not been properly purified from animal matter which, in the opinion of the examiner, renders it unfit for medical use, he is correct; but if no such cause of unfitness exists, and the acid is pure, we cannot understand on what just grounds it

can be condemned, as it is a distinct chemical substance. The time has gone by for fastidiousness in reference to the source of chemicals; to the chemist all matter is interesting, and where his skill suffices to purify a well characterized substance, it should stand on its own merits, and not be judged by its origin. Had this principle been carried out we might yet have been receiving our muriate of ammonia from the sublimations of camel's dung, or our other ammoniacal salts wholly from the distillation of animal matter, instead of resorting to that interesting source of chemical wealth—the coal tar liquor of the gas works.

In relation to the peculiar odor of benzoic acid sublimed from benzoin—due to an empyreumatic oil—we have no reason to believe it is concerned in the medicinal power of the acid, else the other *legitimate* mode of making it in the *wet way*, by boiling the benzoin with lime on an alkali and precipitation by muriatic acid, would be objectionable. Benzoic acid is used in perfumery, and for such use the sublimed acid no doubt has peculiar advantages, but that is no reason why the physician and pharmacist should be deprived of a *purer* article at a cheaper rate.

CHEMICAL HISTORY OF LUPULIN.

By M. J. PERSONNE.

The author, in the October number of the "*Journal de Pharmacie*," commenced his essay by giving the natural history of Lupulin, based on a careful study of its development, with the microscope. Passing this by for the present, we propose to give a notice of his results in the second part of his essay contained in the November number of the same Journal.

The matter contained in the grains of lupulin has a complex composition. The principles are of two kinds, those which are obtained by distillation with water, and those which are not volatile with aqueous vapor.

The distillate consists of an acid distilled water on which floats a volatile oil sometimes of a beautiful green color; and M. Personne found that recent lupulin yielded more oil and less acid than old lupulin.

Volatile acid of Lupulin.—After separating the volatile oil, the distilled water was saturated with carbonate of soda and evaporated to dryness. The dry mass dissolved in a little water was treated with sulphuric acid mixed with an equal weight of water, which formed sulphate of soda, and liberated a brown oily liquid which floated on the saline solution, and which emitted a penetrating odor of butyric and valerianic acid.

Submitted to distillation, this oily liquid commences boiling at 266° F., and the temperature becomes stationary at 347° F. for some time, and finally rises to 356 and 392°. By repeated rectifications the boiling point becomes stationary at 347° and the liquid distills without alteration.

This acid, obtained in a state of purity, is a slightly oleaginous liquid very fluid, colorless, a strong and persistent odor of valerianic acid; its taste acid and pungent; it produces a white spot on the tongue like the strong fatty acids; it is not solidified at 4° F., and burns with a sooty flame. Its density at 59° F. is 0.9403.

Burnt with oxide of copper it gave C 58.64 H 9.91 O 31.45 which is equivalent to the formula $C^{10}H^{10}O^4$ or $C^{10}H^9O^3 + HO$. Both the silver and baryta salts of this acid were analysed and afforded results corresponding to the above. The acid in lupulin is therefore *valerianic acid*, a fact corroborated by the odor of the lupulin.

Volatile oil of Lupulin.—This volatile oil, in its crude state, is an oleaginous liquid, more or less fluid according to the age of the lupulin yielding it, and is lighter than water. It has always an intense yellowish green or fine green color; its odor recalls that of the hop, but does not resemble that of valerianic acid, unless the oil has become oxidized by exposure.

When heated it commences to boil at 282° F., and boils for some time between 300 and 320° F., after which the boiling point rises to 572° F. Heat acts injuriously on the oil, a part being changed in the process of rectification.

That portion of the purified oil obtained between 300 and 320° is a very fluid liquid, having a light amber color, an odor which does not recall that of the hop, and a density of 0.8887. It has no acid reaction, but exposed to the air it becomes acid and resinous: it is but slightly soluble in water, to which it com-

municates its odor, this solution is quickly acidified on exposure to the air. The oil is soluble in alcohol and ether, at 2° F. it thickens but retains its transparency, and its circular polarization is right handed.

Sulphuric acid colors it red and unites with a portion forming a copulated acid whose baryta salt is soluble in water. Nitric acid colors it purple at first, but if heated slightly it reacts quickly with the production of valerianic acid and resin. A concentrated solution of potassa when mixed with the oil and exposed to the air forms valerianate of potassa and a resinous matter. Fused potash transforms it into carbonate and valerianate of potassa with the disengagement of hydrogen and a liquid hydro-carbon. This reaction with potassa is important, because after many unsuccessful attempts and a great number of analyses it is this which has developed the true nature of this essence and placed it beside the oil of *valerian*. By repeated rectification from potassa M. Personne obtained light oil having the formulæ $C^{10} H^8$, which boils at 320° F. and which is isomeric with the *borneën* of oil of valerian. The action of potassa fusa on oil of lupulin (or hops) consists in eliminating the liquid hydro-carbon $C^{10} H^8$, and in retracing an oxygenized body which, like the oil of valerian, it transforms into carbonic and valerianic acids, and which is isomeric with *valerol*.

The crude oil $C^{56} H^{46} O^6$ may be considered as a mixture of the body $C^{10} H^8$ with a body $C^{12} H^{10} O^2$ thus; $3(C^{12} H^{10} O^2) + 2(C^{10} H^8)$. Whilst the purified oil obtained between the temperatures of 300 and 320° may be viewed as $C^{22} H^{18} O^2 = C^{12} H^{10} O^2 + C^{10} H^8$.

When the solid residue of lupulin, left after distilling the oil, is dried and exhausted with alcohol, it affords a resinous substance which is transformed into valerianic acid by the action of potassa. On mixing this solid residue with slacked lime, and distilling at a temperature below that necessary to char it, a brown oily liquid is obtained, having a penetrating odor. This oil, when rectified, furnishes a liquid boiling at 194° F., having a penetrating ethereal odor, scarcely soluble in water, very soluble in alcohol and ether, and without action on litmus. The density of this liquid is 0.8009.

This body absorbs oxygen from the air very readily and ra-

pidly acidifies. Treated by potassa, it becomes brown and resinous ; it reduces the nitrate of silver with the greatest facility, and is transformed into valerianic acid, without the production of resin, by chromic acid. All these properties designate this body as an aldehyde, and analysis has proved that it is the aldehyd of valerianic acid, with the formulæ $C^{10} H^{10} H^2$.

M. Personne found no trace of sulphur in the oil of hops.

Fixed principles of Lupulin.—On examining the residue of the lupulin after distillation the author found but two substances to merit special notice—a *complex resinous substance* and a *bitter principle*.

The resinous matter of Lupulin is difficult to obtain in a pure state. The residue noticed before, is boiled with water in successive quantities, till the bitter principle and as much of the acid as possible is removed ; it is then boiled in alcohol until all but the cellulose of the lupulin grains is dissolved. The hot alcoholic solution deposits a species of wax by cooling. The cold alcoholic liquor by evaporation yields the resinous matter. As thus obtained it yet retains a little volatile oil and valerianic acid. It softens by the heat of the hand, has a yellow color varying from a golden yellow to deep orange, according to its age and exposure ; after long exposure to the air it obstinately retains the odor of hops. It is slightly soluble in water and communicates to it the property of frothing by agitation. Cold solutions of potassa and ammonia dissolve the larger portion of it and separate a resin insoluble in these alkalies, but soluble in alcohol, and which is dry, friable, and odorless. When the alkaline solution is saturated with sulphuric acid the resin is precipitated free from valerianic acid.

This substance should not be considered a true resin but is a product, intermediate between resin and volatile oil. It composes two thirds of the weight of the lupulin of commerce.

The bitter principle—which the author calls *Lapuline*—exists in the aqueous decoction of lupulin, and appears to belong to the class of alkaloids and contains nitrogen. After many attempts in which means of the most varied character were employed he was unsuccessful in isolating this principle in a state of purity, yet he has approached sufficiently near to form an opinion of its nature. It is readily precipitated by tannic acid,

but when an attempt is made to separate it from the tannic precipitate by oxide of lead, nothing was obtained but a resinoid body. The tannic precipitate, as well as the solution of the bitter principle, was treated with potassa in the idea of obtaining a volatile alkali, but the only product was ammonia. To prove whether this ammonia was derived from the decomposition of the bitter principle or from an ammoniacal salt coexisting, he added an alcoholic solution of tartaric acid to an alcoholic tincture of lupulin (1 to 4) and obtained a precipitate of bitartrate of ammonia. The liquid was separated, and by careful evaporation it yielded resinous matter and a bitter acid liquid. This liquid was digested with hydrated carbonate of lead and evaporated at a low temperature, and treated with alcohol which dissolved the bitter principle and left the tartrate and resinate of lead.

The aqueous solution of this body is precipitated by tannin, ioduretted iodide of potassium chloride of gold and chloride of platina, which affords a double salt soluble in alcohol. This, submitted to heat evolves ammoniacal vapors and an odor of burnt horn. Heated with potassa it gives ammonia and a resinous body. When an attempt is made to evaporate the aqueous solution, the residue consists of acetate of ammonia and resinous matter, without bitterness. Being unable to isolate it, or to get a regular combination with this body for analysis, the author has been unable to demonstrate its true nature, yet he feels justified in believing that this extremely unstable bitter principle belongs to the class of the organic alkalies.

After demonstrating the presence of free phosphoric acid in the decoction of lupulin (which he believes is derived from phosphate of lime by the reaction of valerianic acid), the author concludes his second essay by stating that the cavity of the grains of lupulin contains an abundant resinous matter; an essential oil formed of a hydro carbon with the formula $C^{10} H^8$; and an oxygenous body analogous to *valerol* $C^{12} H^{10} O^2$; valerianic acid; a nitrogenous very unstable bitter substance (*lupuline*) possessing some of the properties of the organic alkalies; an ammoniacal salt; and phosphate of lime.

ON A NEW METHOD OF ALKALIMETRY.

By ASTLEY PASTON PRICE, Ph.D., F.C.S.

Chemical Assistant in the Laboratory of the Government School of Mines.

Having had occasion, some time since, to test the comparative value of the ordinary alkalimetical processes, I was somewhat surprised at the discrepancies in the results I obtained, and also at the somewhat difficult and tedious manipulation necessary when comparatively accurate determinations were required. The most serious impediment in carrying out the usual alkalimetical processes, arises, as is well known, from the liberation of carbonic acid, the presence of which, even in exceedingly small quantity, being sufficient to mask the point of saturation, and to prevent the indication of the presence of either an excess of acid or of alkali.

After having experienced the difficulties attendant on its presence, and the almost impossibility of rapidly and entirely expelling the liberated carbonic acid from solution, it appeared to me most desirable to seek an alkalimetical process, in which the carbonic acid should be expelled previous to determining the saturating power of the alkali under examination. It further appeared to me, that in the alkalimetical processes now in use, there existed another very serious inconvenience, in that the percentage of alkali was determined directly, and not indirectly; that is, that the alkali was estimated, and not the impurities which might be therein contained. This may perhaps be better understood by an example. Pure carbonate of soda contains about 58.5 per cent. of alkali, but commercial carbonate contains only about 50 per cent. Now in the several alkalimetical processes employed in the arts, the 50 per cent. of alkali is estimated, and not the 8.5 per cent. of impurities, constituting, as these impurities invariably do, by far the smaller proportion of the commercial alkalis or alkaline carbonates.

In practice, it will, I believe, be found advantageous to employ a method which, by indicating the amount of impurities present, will give the available proportion of alkali.

As I have previously remarked, the primary difficulty to be overcome is the entire expulsion of carbonic acid, the presence of but a small quantity of which entirely prevents accurate determination, not only owing to the change of tint produced

by its presence on a solution of litmus, but owing to the diminished sensibility of litmus thus tinted.

In the hope of avoiding those sources of error to which I have alluded, and of facilitating the determination of the per centage of alkali, I adopted a method of alkalimetry which in substance is the following:—To the alkali under examination is added a known excess of a normal solution of oxalic acid; and after the expulsion of carbonic acid from the solution by boiling, the excess of oxalic acid remaining is determined by means of a standard solution of ammonia.

Some objection might be made to the employment of a solution of ammonia; but it will be found that a dilute solution of ammonia; if kept in properly constructed apparatus, will remain more constant than might be expected. The standard solutions of ammonia and of oxalic acid are most easily prepared by means of a standard solution of sulphuric acid, care being taken that perfectly pure acid be employed, and that the amount of real acid be carefully determined.

Having prepared the standard solutions of a desired strength, the determination of an alkali or of an alkaline carbonate may be thus effected:—10 grs. of an alkaline carbonate, carbonate of soda for example, after having been placed in a flask, a solution of oxalic acid corresponding to 10 grs. of pure carbonate of soda is added; the solution is then boiled until the expulsion of carbonic acid be effected, when the solution is diluted with distilled water; and after the addition of a few drops of a solution of litmus, the excess of oxalic acid is determined by a standard solution of ammonia. The excess of oxalic acid remaining will of course indicate the impurities present, or the absence of alkali, which, by deduction from the quantity originally taken, will give the amount of available alkali.

Care must be taken that the solution be only tinted with litmus, and not too deeply colored, as the more feeble the coloration within certain limits, the more easily detected is the change of tint produced by an excess of alkali or acid.

I have found it necessary to employ distilled water, failing, as I have done, to obtain accurate results with other water, owing to the presence of carbonic acid. The preparation of standard solutions is so well understood, that it is unnecessary to enter into further details.

The apparatus I have found most convenient for containing and preserving standard solutions, and more particularly solutions of ammonia, consists of a vessel similar to a wash-bottle, to which is attached an India rubber bulb; so that when it is desired to fill the burette, it is only necessary to compress the bulb. This arrangement affords great facility for replenishing the burette; and by placing a piece of India rubber tubing, closed at one end, on the jet, an air-tight reservoir for the solution is obtained.—*Chem. Gaz. from Proc. Brit. Associa.*, 1854.

ON THE PHYSIOLOGICAL PROPERTIES OF SOME OF THE COMPOUNDS OF THE ORGANIC RADICALS, METHYLE, ETHYLE, AND AMYLE. By JAMES TURNBULL, Esq., Physician to the Liverpool Royal Infirmary.

He had examined two compounds of methyle—the acetate of the oxide of methyle, and the iodide of methyle; four of ethyle—the acetate of the oxide of ethyle, the iodide of ethyle, the bromide of ethyle, and the cyanide of ethyle; two of amyle—the acetate of the oxide of amyle, and the iodide of amyle. The acetate of the oxide of methyle acted as a diffusible stimulant, and checked expectoration—a property common to most of the methyle, ethyle, and amyle compounds. The iodide of methyle produced all the physiological effects of iodine, and might be detected in the saliva and urine in half an hour after it had been swallowed. He had used it as an external remedy in scrofulous ulcers with advantage, and he had used it for inhalation in pulmonary diseases, to promote the healing of ulcers of the lungs; but for the latter purpose he had found another preparation, the iodide of ethyle, more serviceable. The iodide of ethyle he had found a warm stimulating remedy, which produced the physiological effects of iodine, too, but was less stimulating. It acted as a powerful anæsthetic when inhaled, and he had ascertained that the injurious effects which Mr. Nunnely had observed from it had arisen from his having used an impure compound contaminated with phosphorus. He had used it internally in scrofulous diseases with advantage, and as its odor was perceived in the breath there seemed to be a special tendency to the elimination of this and other ethyle compounds through the lungs. As

an external application he had found it more suited for painful and irritable ulcers than the iodide of methyle, which answered best for those of indolent character. He had used it for inhalation in many cases of pulmonary disease, and believed it would prove more valuable for this purpose than any remedy yet introduced. Medical men had hitherto been disappointed in almost all the means tried for the treatment of pulmonary disease by inhalation. This proved that it was either an improper mode of treatment, or that they had not yet met with the right kind of remedies. He believed the latter to be the true cause of past disappointment. Iodine had been much tried, but laid aside on account of its irritating effects; and it had not occurred to any one that, in order to give it for inhalation, it would first be necessary to find a compound possessing the requisite degree of volatility and absence of irritative properties. Iodide of ethyle was in his opinion such a compound, and had much resemblance to chloroform. He believed that it would be found applicable for treatment in the way of inhalation of other diseases, besides those of the lungs, and he mentioned one of dropsy from disease of the heart, treated under his care in the infirmary, where it produced a most beneficial effect. The bromide of ethyle he had found similar in its effects to the iodide of ethyle, more pleasant to the taste and for inhalation, but a very expensive medicine, from the difficulty of preparing it. The cyanide of ethyle he had found possessed the poisonous properties of cyanogen, and he had not therefore used it as a medicine. The acetate of the oxide of amyle and the iodide of amyle had also irritating properties, which rendered them unfit for use as remedies. His researches tended to show that organic radicals might be made to take the place of some of the inorganic radicals, such as sodium or potassium; that iodine, and probably other medicinal agents, were equally capable of producing in such combinations their external beneficial effects, and that, so combined, their volatile properties enabled them to be introduced into the system through a new channel hitherto but little used for such a purpose—viz., the lungs, upon which internal organs their local action might also be obtained in a more advantageous manner.—*London Pharm. Jour. from the Proceedings of the Brit. Assoc.*

ON THE LEAVES OF THE COCA OF PERU (ERYTHROXYLON COCA, LAMARCK.

By DR. H. A. WEDDELL.*

Among the numerous vegetable riches of Yungas,† there was none which interested me more than the *Coca*, in consequence of the various and sometimes contradictory opinions put forth regarding it. I trust that a *résumé* of my studies on this remarkable plant will be perused with interest.

My readers are aware that *Coca* is the dried leaf of a shrub to which botanists have given the name *Erythroxylon Coca*;‡ it

* Extracted from Dr. Weddell's *Voyage dans le nord de la Bolivie*. Paris, 1853, 8vo, ch. xxix.

† A province in the north-east of Bolivia.—Ed. Ph. J.

‡ Clusius (1605) appears to be, after Monardes (1569), the first botanist who has treated on *Coca*, which was, however, known in Europe at an earlier period through the accounts given by the historians of the conquest of Peru, but the first who received in Europe authentic specimens of the plant, was Joseph de Jussieu, one of the travelling companions of La Condamine. The life of the adventurous botanist was, however, nearly sacrificed while crossing the Cordillera of Coroico in 1749, in order to study this famous plant. "Il me fallut," he says, "passer la montagne neigée et marcher plus de 4 à 5 lieues dans la neige, la descendre par des chemins taillés en forme d'escalier, au bord de précipices affreux, et avoir à chaque instant, et pendant 7 à 8 lieues, la mort devant les yeux. Ma mule s'abattit deux ou trois fois sous moi; je fus obligé de la laisser estropiée et hors d'état de me pouvoir servir davantage. La violence des rayons du soleil réfléchis par la neige me causa une des plus douloureuses ophthalmies que j'aie éprouvées de ma vie et ce qui me chagrinait le plus était la crainte de devenir aveugle, car je ne voyais rien. Mais une abondante fluxion de larmes, causée par la même irritation, au bout de vingt-quatre heures d'un tourment continu, me rendit la vue et la sérénité, et fut ma guérison. La beauté et l'abondance des différentes plantes que produit cette région me consolèrent et me dédommagèrent des travaux passés." . . .

The specimens sent by Joseph de Jussieu to his brother, in 1750, were subsequently examined by Antoine-Laurent de Jussieu, who referred the plant to the genus *Erythroxylon*, and finally served as types for the description which Lamarck gave of it under the name *Erythroxylon Coca* in his *Encyclopédie*.

The generic name refers to the color of the wood of several of the plants composing the group; as to the word *Coca*, of which, so far as I know, no one has sought to give the etymology, it probably comes from the Aymara

occurs wild, I am told, in several parts of Bolivia; but I have myself studied it only in the cultivated state, and it is this cultivated plant alone that will be here in question.

The employment of *Coca* as a masticatory* goes back to the time of the first Incas, a period when it was reserved essentially for the solemnities of religion† and for the use of the monarch; none other might raise it to his mouth, unless he had rendered himself worthy by his services, of partaking this honor with his sovereign.

The localities in the Peruvian empire where the plant could be cultivated, were then few in number; but in proportion as its territories became extended by new conquests, plantations were multiplied, and the use of *Coca*, spreading more and more, became at last general; so that at the period of the Spanish invasion, the Peruvians were accustomed to use the article as a medium of exchange; and when money of gold and silver entered into circulation, *Coca* was the principal object of commerce in the country.

The Spanish speculators appreciating the advantages they might derive from the culture of the plant, were not slow in appropriating it to themselves as a monopoly; and so great were the profits they obtained, that, the number of plantations having increased beyond measure, there were soon not hands enough in the valleys to give them the requisite care. They then employed the Indians of the Cordillera, enrolling them by force as for the labor of the mines. But the transition from a cold and dry climate to one both warm and moist, reacted so fatally on the health of the new workmen that the central government, roused by the numerous complaints addressed to them on the subject,

Khoka, signifying tree or plant. The shrub producing the Paraguay Tea (*Ilex Paraguariensis*) is called *la Yerba*, i. e. the plant; and the same may be the case with the Peruvian *Coca*.

* In accordance with usage, I designate *Coca* a masticatory. In its use, it is however distinguished from ordinary masticatories, and especially from tobacco, by one peculiarity, which is, that the saliva, the secretion of which it excites, is never rejected.

† The sacrificing priests never consulted the oracles without holding some *Coca* leaves in the mouth, and throwing some into the fire which consumed the victims.

was on the point of ordering the destruction *en masse* of all the plantations of the country. The representations of the parties interested in the question, supported by the arguments of several celebrated legal authorities, diverted this threatening resolution, and the cultivation of the *Coca* remained authorized, on the condition of only voluntary and well-paid laborers being employed upon it.

One may form some idea of the warmth with which the government espoused the cause of the Indians in this affair, from the fact of the viceroy of Peru, Don Francisco de Toledo, having promulgated no fewer than seventy-one decrees in their favor.

This occurred in the latter half of the sixteenth century. In the following century the cultivation of *Coca* took a retrograde step, in consequence of the diminution of the Indians, who were its chief consumers; but by little and little the trade afresh increased, so much so indeed that at the present day it appears to be about equal in importance to what it was at the period of its greatest prosperity, when in the mines of Cerro de Potosi alone it was consumed to the extent of a million *kilogrammes* [2,204,860 pounds (Avoird.)] annually.

The cultivation of *Erythroxyton Coca*, as carried on in Bolivia in the present day, does not appear to differ from that which prevailed previous to the conquest; and the province of Yungas de la Paz* is that which, since the Spanish occupation, seems to have supported the most considerable plantations. All the slopes of the mountains, below an elevation of 2200 *mètres* [7217 feet,] are literally covered with them, and the traveller has continually in view the factories or *haciendas* where the leaf is prepared for the purposes of trade.

The *Coca* shrub is propagated from seed. For this purpose the seeds, immediately after gathering, are scattered on the surface of the light and frequently watered soil of a little nursery (*almaciga*) where they come up generally at the end of ten or fifteen days. The waterings are continued, and should the sun strike the young plants too violently, they are sheltered with mats.

* The word *yungas* signifies in the Aymara language, *warm valleys*. The medium temperature is from 18° to 20° [64° to 68° Fahr.]

The following year the shrubs, whose height is already from 40 to 50 *centimètres* [16 to 20 inches] are transplanted into a plot of ground specially prepared for them and called a *cocal*. The arrangement of these plantations is much more complicated than that of an ordinary plantation, and varies according to the inclination of the surface. When the *cocal* occupies the slope of a mountain, which is the usual case, the cultivator forms a series of narrow steps, each intended for a single row of shrubs, and the more elevated (consequently the less numerous) as the surface is more steep.* They are generally supported by little stone walls, which serve not merely to contain the earth and prevent its drying, but also to protect the stem and roots of the young shrubs from the too direct influence of the solar rays, by means of the projection which they form above the level of the soil.

Where the ground is level they make, instead of steps or terraces, simple furrows (*uachos*) in a straight line and separated from one another by little walls of well-moulded earth, called *umachias*, at the foot of each of which is planted a row of the shrubs more or less apart from each other.

At the end of a year and a half the plant affords its first crop, and from this period to the age of forty years or more it continues to yield a supply. Instances are cited of *Coca* plantations which have existed for nearly a century, and which still produce. Nevertheless, the greatest abundance of leaves is obtained from plants of from three to six years of age. When the trees run up too much, the produce is less than when they spread; they are therefore pruned in some cases to favor an increase in breadth which, however, is never considerable as the form of the shrub is irregular. The average height of the wild plant appears to be about two *mètres*; but in cultivation it is generally allowed to attain but one *mètre* [39 inches.]

The first gathering which takes place in a *Coca* plantation is at the expense of only the lower leaves of the shrubs; and it is therefore called *quita calzon*.† The leaves of which this gathering consists are larger and more coriaceous than those of subse-

* On some of the slopes the inclination exceeds 45°.

† From *quitar*, to take away, and *calzon*, pantaloons.

quent collections, and also have less flavor. They are mostly consumed on the spot. All the other gatherings go by the name of *mitas*, and take place three times, or exceptionally four times, per annum. The most abundant harvest is that occurring in March, that is, immediately after the rains; this is the *mita de marzo*. The most scanty is that which takes place at the end of June, or beginning of July, and which is called *mita de San Juan*. The third, named *mita de Santos*, is made in October or November.

The watering of the Coca plantations greatly increases their productiveness. Forty days are then sufficient, I have been told, for naked shrubs to become covered with new leaves; but these leaves are not equal in their properties to those produced without irrigation; their color also is less deep, and they frequently blacken in drying. Artificial watering is needful, moreover, only during the dry season, and the cultivators who have the means of employing it, realize nearly always four, and sometimes even five, crops in the year. This is particularly the case in the districts of Irupana, where there are facilities for obtaining water that do not exist elsewhere.

I have examined the soil in which *Coca* is cultivated, and almost everywhere have found it composed of sandy, argillaceous earth, softish to the touch; it originates in the decay of the schists, which form the chief geological feature of these mountains. The soil of the coca plantation is, in one word, formed of what we call primitive or normal earth [*terre franche ou normale*;]* but it is naturally mixed with an abundance of angular fragments of unaltered schist, which, if not removed, would interfere with the growth of the roots. This is therefore done by the cultivator while preparing the furrows for the reception of the shrubs, the stones being employed for the little walls before spoken of; indeed these little walls or *umachas* are often formed entirely of the stones thus met with. I need hardly say that it is to the greater or less perfection to which this preliminary operation is carried, and to the labors incurred subsequently in stirring up the soil from time to time, and in keeping it free from weeds, that the *haciendero* owes the abundance of his crops. The

* This is also the soil of almost all the virgin forests of the Andes.

last operation I have mentioned, is especially needful while the shrubs are young. The weeding, which is regularly performed after each crop has been collected, is called *mazi*.

The collection of the leaves of the *Erythroxylon* is performed much in the same way as that of tea. It is, in general, women and children that are employed upon this operation, which is all the easier from the presence of the little walls separating the furrows of the plantation. The gatherer squats down, and holding with one hand the branch she wishes to pluck, removes with the other all the leaves, often one by one. The leaves are deposited in a cloth which each Indian carries with her, and afterwards collected in sacks or some other recipients to be carried from the plantation.

Nothing is now easier than the preparation of the *Coca*. The leaves are carried from the plantation to the house, or *casa de hacienda*, where they are spread out in the sun, in little courts constructed especially for the purpose, and the floors of which are formed of slabs of black schist (*pizara*;) if the weather is fine they are left there until completely dry, which takes place without their shape becoming altered. They are then packed with strong pressure into bags made of the sheath of the banana leaf, strengthened with an outer covering of coarse woollen canvas. The bales thus formed contain, on an average, twenty-four pounds of leaves, and go by the name of *cestos*. The *tambor* is a bale of double the size of the *cesto*, whose price at La Paz varies from $4\frac{1}{2}$ to 6 piastres (22 fr. 50 c. to 30 fr.)

I have endeavored to collect some data as to the average production of the plantations of coca in the province of Yungas, but the information given me on this subject is but vague. The surface under cultivation is estimated by the *cato*, a superficial measure varying according to the district, but which appears, on an average, to equal about 900 square *mètres* (9 *ares*.) The produce of the most flourishing coca grounds of Yungas appears to be in the proportion of from eleven to twelve *cestos*, i. e. 264 to 288 pounds, of dried leaves per *cato*, whilst the poorest plantations afford but from one to two *cestos* at each gathering. The medium production would be from seven to eight *cestos* per *cato*. The annual produce of the whole province is estimated at more than 400,000 *cestos*, or 9,600,000 Spanish pounds.

(To be continued.)

MATERIALS FOR PAPER-MAKING PROCURABLE FROM INDIA.

By J. FORBES ROYLE, M. D. F.R.S.

Paper, it is well known, is in Europe made chiefly from linen or cotton rags, but also from the refuse and sweepings of cotton and flax mills, as also of the coverings of our cotton bales and of worn-out ropes. But paper is also made from the stems and leaves of many grasses, as from rice-straw, and from the bamboo by the Chinese, and of late from common straw in this country, and even from wood shavings. The fibrous part of many lily and aloe-leaved plants have been converted into excellent paper in India, where the fibres of tiliaceous, malvaceous, and leguminous plants are employed for the same purpose. As in the Himalayas one of the lace-bark tribe is similarly employed, and in China one of the mulberry tribe, and the nettle in Holland. I mention these various sources, because plants belonging to the same families as the above abound in India and other warm countries, and are capable of yielding a very abundant and never-failing supply of sufficiently cheap and very excellent materials for paper-making of all kinds. Some may be used without any further process of bleaching, but all are capable of having any color they may possess destroyed by chemical means, as I would not even except the jute canvas or gunny bagging, because I have seen specimens of jute of a beautiful silky white, both plain and manufactured into fabrics for furniture, &c., as shown by the late Colonel Calvert at the East-India House. As the Chinese make paper of rice-straw, and of the young shoots of the bamboo, while the Hindoos make ropes of different grasses (such as *Saccharum munja*, and *Saccharum sara*), strong enough for their Persian wheels as well as for towing lines, it is evident that these, and probably many others, contain a sufficiency of fibrous material for paper-making. The cultivated cereals cannot well be turned to much account, for their straw forms the chief food for cattle; but as the country abounds with grass jungles, which are in the autumn of every year burnt down in order that the young blades may spring up and afford pasturage for cattle, it is evident that there are many situations where a sufficiency might be cut down before it has become per-

fectly dried up, and converted into *half-stuff* for paper-makers. Of the sedges also some are employed in India for making ropes, as the Bhabhur or *Eriophorum cannabinum*, for making rope bridges for crossing some of the hill torrents. The papyrus, we know, was used by the Egyptians for making their paper, but this was by cutting the material into thin slices and making them adhere together under pressure. But others of the genus, as the *Cyperus tegetum*, is used in India for mat-making. As these plants, as well as rushes, grow together in large quantities, it would be quite possible in many places to turn them to profitable account.

Many parts of the world abound in the lily and aloe-leaved plants which have been alluded to above, and of which the leaves contain much easily separable fibrous materials. These belong to the genera Agave, Aloe, Yucca, Sauseviera, Bromelia, and others, all of which abound in white-colored fibres, applicable to various useful purposes, and of which the tow might be used for paper-making, and considerable supplies obtained. Paper used to be made from the Sauseviera in Trichinopoly, and some made of the unbleached Agave alone, and also mixed with old gunny bags.

Among cultivated plants there is probably nothing so well calculated to yield a large supply of material fit for making paper of almost every quality, as the plantain (*Musa paradisiaca*), so extensively cultivated in all tropical countries on account of its fruit, of which the fibre-yielding stems are applied to no useful purpose. The plant, as every one acquainted with tropical countries knows, is common near the poorest huts and in the largest gardens, and is considered to yield by far the largest quantity of nutritious matter. Its fruit, in many places supplying the place of bread, and in composition and nutritious value approaching most nearly to the potato, may, if produced in too large a quantity, be preserved in the same way as figs, or the meal may be separated, as it resembles rice most nearly in composition. Each root-stock throws up from six to eight or ten stems, each of which must be yearly cut down, and will yield from three to four pounds of the fibre fit for textile fabrics, for rope-making, or for the manufacture of paper. As the fruit already pays the expenses of the culture, this fibre could be af-

forded at a cheap rate, as from the nature of the plant, consisting almost only of water and fibre, the latter might be easily separated. One planter calculates that it could be afforded for £9 13s. 4d. per ton. Some very useful and tough kinds of paper have been made from the plantain, and some of finer quality from the same material in France.

All the plants which have been already mentioned are devoid of true bark, and are called endogenous in structure. Simple pressure between rollers, and washing, would appear to be sufficient for the separation of the fibres of most of them. But the following families of plants are all possessed of true bark, which requires to be stripped off, usually after the stems have been steeped in water, before their respective fibres can be separated from the rest of the vegetable matter.

The flax plant abounds in fibre, but this is too valuable to be converted into paper. India, however, grows immense quantities of the plant on account of its seed (linseed), which is both consumed in the country and exported in enormous quantities, but nowhere is the fibre turned to any account. This is no doubt owing to the climate not favoring the formation of soft and flexible fibre; but the short fibre which is formed and might be easily separated, would be valuable for paper-making, and might add to the agriculturist's profits without much additional outlay.

Some valvaceous plants are cultivated on account of their fruits, being used as articles of diet, as the Okhro (*Hibiscus esculentus*) of the West Indies and of the United States. The *Ramturai* of India is closely allied to it, and is cultivated for the same purposes. Both plants abound in fine flexible fibre, which is not, but might be easily, separated, and afford a considerable supply, especially if the cultivation was extended in the neighborhood of towns. Paper is made from a species of *Hibiscus* in Japan, and *Hibiscus Sabdariffa* is cultivated in India on account of its jelly-yielding calyxes. Numerous other species of *Hibiscus*, of *Sida*, and of other genera of this family abound in warm climates; several are cultivated in different countries, as *Hibiscus Canabinus* and *Sida Tiliæfolia* in China; more might be so. They grow quickly and to a large size, and abound in fibrous material of a fine, soft, flexible quality, on which account

they might be cultivated with profit, and the tow be useful to the paper-maker.

The *Tiliaceæ* are likewise remarkable for the abundance and fine quality of fibre which many of them contain. *Tilia Europea* produces the enormous quantities of bast exported from Russia. *Corchorus olithorius* and *Corchorus capsularis*, the leaves of both of which are used as a vegetable, yield the large supply of jute imported into this country, as well as the gunny cloth and bags exported even to America. Several species of *Grewia* yield fruit, on which account they are cultivated. Others abound in the jungles, and most would yield a valuable fibre, as some of them already do, for commercial purposes. Some paper is made from gunny bags. Some of the *Leguminosæ* also abound in valuable fibre. *Crotalaria juncea* yields the common *sunn* of India. *Sesbania Cannabina* yields the *dhanchi* of Bengal; while *Bauhinea racemosa* is used in making the rope bridges in the Himalayas. The fibre of *Parkinsonia aculeata* was sent to the exhibition in 1851, expressly as being fitted for paper-making; though colorless it wants strength.

Several plants produce large quantities of a silky, cotton-like substance, not applied to any use, such as the silk-cotton tree, the mudar of India, and several species of *Saccharum*, which might be collected where labor is cheap, and would no doubt be well fitted for conversion into pulp for paper.

Among the nettle, the mulberry, and bread-fruit tribes of plants, there are many which seem well calculated to yield material for paper-making. The Chinese, we know, employ the inner bark of morus, now *Broussonetia papyrifera*. This, no doubt, produces some of the Chinese paper, which is remarkable for toughness. I believe that the refuse cuttings of the bush cultivation of the mulberry in Bengal might be turned to profitable account. The barks of many stinging (*Urtica*) and of stingless (*Bohemeria*) nettles abound in fibres remarkable for strength; the tow of these might be converted into paper-stuff if not required for mixing with wool.

The weeds of tropical countries, which grow in such luxuriance, and among which are species of sida, of grewia, of corchorus, of triumphetta, and of many other genera, might all yield an abundance of fibrous material if the refuse of the above cultivated plants was found not to be sufficient. Some simple

machinery for separating the fibre would greatly facilitate operations, while the expenses of freight might be diminished by compression, or, as suggested, by packing the material as dunnage, and the cheapness of labor, as of everything else in many of these countries, would enable material for paper-making to be brought here in great abundance, and at a sufficiently cheap rate, if ordinary pains were taken by the consumers in Europe to encourage the planter or colonist of a distant region.—*London Pharm. Journ.*, from *Journal of the Society of Arts*.

East India House, May 3d, 1824.

ON SAPONINE AND SENEGINE.

By P. A. BOLLEY.

Bley and Bussey have found in the root of *Gypsophylla struthium* the so-called Levantine soap-root, a peculiar vegetable principle, which the former termed struthiin, and the latter saponine. In so far as an assumption may be hazarded, it is the same substance which has been previously found in *Saponaria officinalis*. Bussey has ascertained the composition of this substance. The senegine discovered by Gehlen, a bitter substance obtained from the root of *Polygala senega*, has been closely examined by Quevenne, and the elementary analysis known was performed by this chemist.

The physical and chemical properties of both substances are so analogous that the subject excited Quevenne's attention, but a comparison of some reactions which he undertook led him to the conclusion that it was quite a different body. At the most, his conclusion was supported by the elementary analysis of saponine made by Bussey, and by that made by himself of senegine. The principal difference should be found in an important distinction in their behaviour towards concentrated muriatic acid.

According to Bussey, saponine contains 51 per cent. of carbon, 7.4 per cent. of hydrogen; and senegine, according to Quevenne, 55.704 per cent. of carbon, and 7.529 per cent. of hydrogen.

I have prepared Senegine according to Quevenne's process

from the officinal extract, by precipitating with sugar of lead, filtering, washing, and decomposing the precipitate with sulphuretted hydrogen, filtering, evaporating, taking up in hot alcohol, evaporating, agitating with ether, dissolving the portion not taken up by ether in water, precipitating with diacetate of lead, filtering, washing, diffusing the precipitate in water, decomposing by sulphuretted hydrogen, filtering, evaporating, taking up in boiling alcohol, and allowing to cool.

That which I obtained agreed considerably in its chemical behaviour and external properties with Quevenne's senegine, but I have not succeeded in obtaining this body perfectly white; the powder had always a grey, yellowish shade, resembling quercitanic acid, and was never obtained quite free of inorganic constituents. Only by repeated solution in strong hot alcohol, and cooling, by which the chief part of these bodies separates, I reduced them to 1 per cent.

Bussey's saponine is prepared in a very simple way, by boiling the incised root with alcohol of 85 per cent., and hot filtration and cooling, whereby the saponine separates. The substance obtained was quite white, but likewise not completely free from ash, but still the incombustible portion was less than in the mass obtained from the extract of senega.

Both substances possessed all the properties everywhere ascribed to them—slight solubility in cold, and greater in hot water; frothing of their solutions; solubility in alcohol, which is greater in diluted than in anhydrous alcohol, and greater in hot than in cold alcohol; insolubility in ether, and absence of definite form. Taste at the commencement somewhat sweet, but afterwards slightly pungent and bitterish.

By the combustion of these bodies I obtained results from which I calculate the formulæ for senegine, $C_{36} H_{24} O_{30}$, and for saponine $C_{36} H_{28} O_{24}$. It will be seen that there is a considerable difference in the quantity of water contained in them.

I believe that I shall succeed in showing that the bitter principles of these roots are one and the same, or, at least, exhibited no greater difference than is expressed by the above analyses.

Fremy produced by the action of alkalies or diluted acids on Bussey's saponine, a new acid, which he termed *æsculinic acid*, because it could be prepared from a bitter substance existing in horse chestnuts.

This acid is a white uncrystalline substance, almost insoluble in cold water and ether, but soluble in hot water and alcohol, and occasions strong frothing. Fleury found its composition to be C 57.260, H 8.352, O 34.388.

I treated a clear aqueous solution of the bitter matter of senega with diluted sulphuric acid; after some time it became turbid from the separation of white flocks. By filtration and washing, which is very troublesome, on account of the gelatinous nature of the solid substance, a powder was obtained, which after drying exhibited all the properties of æsculinic acid. I also prepared the same substance from a decoction of senega, without previously separating the senegine, and prepared this substance from the saponine, which was made according to Bussey's directions.

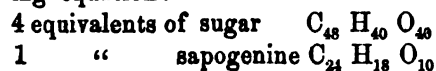
The analyses of these substances afforded the same formulæ for their composition, namely, $C_{24}H_{18}O_{10}$.

Supported by these analyses, it may be with certainty assumed, that the peculiar principles of senega and soap root are one and the same body, and in spite of the difference which these analyses and that of Fleury shows, it is in the highest degree probable that this æsculinic acid is nothing else than the product of decomposition, which is afforded by the action of dilute acids on saponine as well as on senegine, and also that Quevenne's *acide polygalique modifié*, obtained by the action of muriatic acid on his senegine, is the same body.

As was to be expected, a hydrate of carbon was obtained, and at the same time sugar, or a sweet body possessing the known reaction on an alkaline solution of copper.

According to the analogy of salegénine, this product of the decomposition of senegine may be termed sapogénine.

It is very probable that water is taken up by saponine when it is broken up into sapogénine and sugar, as shown by the following equation:—



Annals of Pharmacy, from Annalen der Chemie.

ON PYROGUAIACINE.

By E. EBERMAYER.

The author has obtained a crystallized product by the dry distillation of guaiacum resin. A similar substance has also been described by Deville and Pelletier, from whose analysis the composition of this substance appears to be 76.93 carbon, 7.46 hydrogen, and 15.59 oxygen. It is probably the same substance obtained by Ebermayer, and called by him pyroguaiacine. All specimens of this resin may not produce this body, as Völckel, who has also investigated the products of the distillation of the resin, does not mention it at all, and the author has obtained very different quantities from different resins. In favorable cases he obtained 6 grms. of the pure substance from 6 lbs. of the resin; it was purified by filtration from the oily products, and then by crystallization from alcohol.

Pyroguaiacine has the constitution $C^{14} H^7 O^2$. It is a neutral body, which may be sublimed without change; it is colorless, but when crystallized from alcohol is of a rose or yellowish color; it crystallizes in small laminæ or in long needles, swells up in potash, and is extracted again unchanged by alcohol from the air-dried potash compound, after the potash has been saturated with carbonic acid.

When heated for a long time with caustic ammonia, pyroguaiacine acquires a yellow color; its alcoholic solution, saturated with ammonia, leaves a yellow mass of nearly unchanged pyroguaiacine. When alcoholic solutions of oxide of silver and pyroguaiacine are mixed, silver is reduced.

Dilute sulphuric acid does not act upon pyroguaiacine; but if the latter substance be suspended in water, and concentrated sulphuric acid be dropped into it, and the whole heated, it first of all becomes yellow, then dissolves with a rose-color, and lastly a blue-black substance separates. Concentrated sulphuric acid becomes very strongly heated in contact with pyroguaiacine; the acid first becomes brown, then dingy green, and lastly deep blue, from the separation of a blue-black body containing sulphur.

Chlorine gas, when passed through water in which pyroguaiacine is suspended, colors this first yellow, and lastly brown. The final product is a brittle readily-pulverizable mass, which, like

the wash-water, has a strong musky odor. The analysis I. is of pyroguaiacine crystallized from alcohol; II. is sublimed:—

	I.	II.		
Carbon . .	78.462	78.471	14	78.504
Hydrogen .	6.901	7.042	7	6.542
Oxygen . .	14.637	14.487	2	14.958

—*Chem. Gaz. Oct. 16, from Journ. für Prakt. Chem., lxii. p. 291.*

ON A METHOD OF ANALYSIS APPLICABLE TO THE QUANTITATIVE ESTIMATION OF NITRIC AND ACETIC ACIDS.

By J. H. GLADSTONE, F.R.S.

A good method for estimating the amount of nitric acid present in its compounds, or in mixtures of salts, has long been a desideratum. That which I propose bringing before the notice of the British Association is one which I have frequently made use of; and although it does not give rigidly accurate results, I have found it sufficiently exact for most purposes.

The process is as follows:—Place a weighed portion of the substance to be analysed in a small tubulated retort, and dissolve it in a little water. It will be remembered that all neutral nitrates are soluble; the few sub-nitrates which are insoluble in water should be reduced to a very fine powder. Add to the solution in the retort a large quantity of strong sulphuric acid, very many times more than is requisite to effect the decomposition of whatever nitrates may be present. Attach to the beak of the retort, in such a way as to preclude the escape of any gas, a receiver containing water and a considerable quantity of carbonate of baryta. Heat the liquid in the retort gently at first, but more strongly towards the end of the operation. The nitric acid of course distils over, and will be condensed wholly in the receiver, which, together with the neck of the retort, should be kept cool. There it will decompose the carbonate, forming nitrate of baryta, while the liquid will be ever ready to absorb or receive fresh increments of acid. The distillation should be continued till the sulphuric acid itself rises in vapor, sweeps down the nitric acid which may be adhering to the neck of the retort,

and shows itself in the receiver by the production of a dense white cloud, from its decomposing some of the nitrate of baryta in solution. This decomposition is of no moment, as the nitric acid thus set free immediately decomposes in its turn an equivalent of the carbonate of baryta. The liquid must be boiled in order to agglomerate the sulphate, and to cause the deposition of any carbonate of baryta that may be dissolved by the free carbonic acid. After filtering away the sulphate and undissolved carbonates, a clear solution of pure nitrate of baryta is obtained. This may be evaporated to dryness and weighed; or, as the salt is rather apt to decrepitate when heated, it will be found preferable to convert the nitrate into the sulphate, and from that to calculate the amount of nitric acid which passed over into the receiver.

The points which require special notice in this process are,—1st, the purity of the sulphuric acid employed; as commercial sulphuric acid frequently contains a trace of nitric acid, it must be tested before it is used; 2nd, the gentle heating of the mixture in the retort, when there is a good deal of nitric acid in it, in order to prevent any chance of the formation of nitrous fumes; 3rd, the long-continued heating of the liquid, so as to ensure the distillation of as nearly the whole of the nitric acid as possible. The liquid should scarcely be allowed to boil, lest some portion of a salt should spring over, which, whatever it was, if soluble, would vitiate the experiment. When these precautions are properly attended to, a very good result is obtained. Known weights of pure nitre were tried; the amount of nitric acid found was not 1 per cent. less than the theoretical amount. Very small quantities of nitric acid, combined with other matters, can be determined with considerable accuracy in this way, as was proved when 0.2 gr. of nitre was mixed with phosphate and sulphate of copper and soda, and subjected to the same treatment.

It is self-evident that this process cannot be employed when there is some other acid mixed with the nitrate, which is volatile, and gives a soluble baryta salt; or, rather, the process would require to be modified to suit the particular case, and such modifications can generally be easily devised.

It will also be evident that this process may be applied equally well to a number of other volatile acids. Most of these however

may be estimated by simpler methods. Yet it is valuable as applied to acetic acid, a quantitative determination of which is often a matter of great difficulty. Its applicability to this has been proved by direct experiment. The process is identical with that previously described. The plan suggested does not involve any new principle, but is brought forward merely as a fair mode of overcoming one of the most common practical difficulties in analytical chemistry.—*Chem. Gaz.* Oct. 1854.

ON THE COMPOSITION OF TANNIC ACID.

By A. STRECKER.

It appears from my experiments, that tannic acid and the tannins in general are much more complex bodies than is generally supposed. In fact, by the action of mineral acids, of alkalies, or of ferments, they are resolved into glucose and a new acid by fixing the elements of water. This resolution, which I announced two years ago, has served me as a starting-point in the determination of the molecule of tannic acid.

According to the analyses of Pelouze, Liebig and Berzelius, the molecule of tannic acid is expressed by the formula $C^{18} H^8 O^{13}$, and it is supposed that in its neutral salts 3 equivs. of water of this formula are replaced by 3 equivs. of metallic oxide. There is nevertheless only one tannate (that of lead) which appears from analysis to contain the carbon and metal in the proportion of 18: 3 equivs.

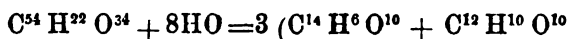
Perceiving from the splitting of tannic acid into glucose ($C^{12} H^{12} O^{12}$) and gallic acid ($C^{14} H^6 O^{11}$) that the above formula could not express the molecule of acid, I undertook a series of experiments to determine the true formula of tannic acid: of these I now lay the results before the Academy.

To obtain tannic acid in a pure state, I purified the acid prepared by the method of M. Pelouze, in two ways; one portion was dissolved in pure ether and the solution precipitated by water, the other portion was dissolved in water and precipitated by ether. Under these conditions two or three distinct strata are obtained, of which the heaviest consists of tannic acid, dissolved in the etherial fluid. This syrupous liquid was dissolved in water and

then evaporated *in vacuo*; the residue was analysed after being dried at 258° F. Ten analyses made with oxide of copper in a current of oxygen gas upon substances obtained at seven different preparations, gave results leading to the formula $C^{54}H^{32}O^{34}$.

	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	Calculated.
C	52.5	52.2	52.2	52.2	52.2	52.3	52.1	52.2	52.3	52.3	54=52.4
H	3.8	3.8	3.7	3.7	3.6	3.9	3.8	3.6	3.7	3.5	22= 3.6
O	—	—	—	—	—	—	—	—	—	—	34=44.0

According to this formula, the resolution of tannic acid into gallic acid and glucose may be represented by the following equation



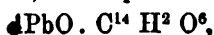
This equation is confirmed by the quantities of the two compounds obtained by the decomposition of tannic acid. The former was found to be 87 per cent. (maximum) by Wetherill; of glucose I have obtained as much as 22 per cent.

The quantity of water which may be displaced by metallic oxide in the molecule $C^{54}H^{32}O^{34}$ I have determined directly by digesting tannic acid with oxide of lead, and the analysis of the neutral and basic salts. By the former method I found that the acid loses 4.4 per cent., or 3 eqivs. of water, which is confirmed by the analysis of the salts of lead prepared by precipitation, in which the composition of the anhydrous acid is represented by the formula $C^{54}H^{19}O^{31}$, differing by 3 eqivs. of water from the formula $C^{54}H^{32}O^{34}$. The precipitates obtained by tannic acid and acetate of lead contain from 8 to 10 eqivs. of oxide of lead, in proportion to C^{54} . The analysis of tannates made by Pelouze, Liebig, Berzelius, Mulder and Böchner, agree with the new formula of tannic acid, if we suppose that some salts do not lose all their water at 212° F., or that they were not completely dried.

According to Berzelius, tannic acid combines with sulphuric or muriatic acid, and, when these acids are added to a solution of tannic acid in water. In these cases precipitates are obtained which are dissolved at the commencement, until the fluid contains an excess of sulphuric or muriatic acid. These compounds are distinguished from the conjugate acids, as the mineral acid can be separated therefrom by salts of baryta or silver. The analysis of these precipitates shows that they are nothing but tannic acid

imbued with the acid liquor in which they are deposited. In fact, this sulphuric tannin only contains from 2 to 4 per cent. of sulphuric acid; and the muriatic tannin, when placed *in vacuo* over quicksilver, loses its muriatic acid completely. Moreover, these precipitates differ in no respects from tannic acid, which has been acidulated with a mineral acid. The formation of a precipitate by a mineral acid in a solution of tannin is therefore perfectly conformable to the precipitation of the same solution by chloride of sodium and other alkaline salts, and even by ether, and must be explained by a diminution of the solubility of the tannin in consequence of the change in the solvent.

Gallic acid, which, according to some chemists, contains in the formula $C^{11} H^8 O^{10}$ 4 or 2 equivs. of water, is, from my analysis, a tribasic acid; and the yellow lead salt, regarded by Liebig and Büchner as a neutral salt, and represented by the formula



is a basic salt, which, when dried at $248^\circ F.$, has a composition represented by the formula



In fact, five analysis performed with materials prepared at different times gave 75.9 to 76.1 per cent. PbO ; numbers which approach much more closely to the latter formula than to that of Liebig and Büchner.—*Chem. Gaz. Oct. 1854, from Comptes Rendus, July 3d, 1854, p. 49.*

ON THE MOLECULAR CONSTITUTION OF TANNIN AND GALLIC ACID.

By M. E. ROBICQUEZ.

In my last investigation on gallic acid fermentation, I have left undecided the question as to whether tannin is a simple isomere of gallic acid, or a combination of gallic acid with a hydrocarbon similar to sugar or gum. The following facts which I had observed, were not sufficient to decide the question. Whatever method is adopted for converting tannin into gallic acid, the transformation is never complete; a part of the tannin is altered and converted into an amorphous and mucilaginous substance possessing some of the properties of the gum. If we operate by

means of fermentation, this substance is found in the liquors, but if the conversion is effected by means of diluted sulphuric acid, a substance similar to humic acid is produced at the same time as the gallic acid, and we are naturally led to think that the sulphuric acid has resolved the tannin into gallic acid and a gummy substance which is afterwards carbonized. It may be added that by no process, whatever care may be taken, is it possible to produce a quantity of gallic acid that shall be more than half the weight of the tannin employed. This last fact, the uniform result of experiments, is much relied upon by those Chemists who believe in the pre-existence of gallic acid in tannin, in the same way as benzoic acid is supposed to exist in hippuric acid. The formula for tannin assimilates to that for gallic acid dried at 212° Fahr., consequently, if the latter is but an isomeric transformation of the former, the product obtained in gallic acid should at least weigh as much as the tannin used. I say at least as much, because, as the transformation takes place in water, the gallic acid obtained is more highly hydrated than that dried at 212° .

But on examining the facts more closely it is found, that in converting tannin into gallic acid it is impossible to avoid the decomposition of a large portion of the former, and it is evident that the tannin is changed as a whole, and is not split in two. When once it is thus modified the tannin is no longer susceptible of conversion into gallic acid, but it is transformed into an amorphous mucilaginous substance. It is on this account that the gallic acid made by Scheele's process is not even equal to half the weight of the tannin contained in the galls used. For the same reason, also, the tannin, already in an altered state, contained in oak bark, yields no gallic acid.

The following experiments appear to me to confirm these views:—

An aqueous solution of pure tannin was submitted, in a close vessel, to the action of pectase, at a temperature ranging from 77° to 86° Fahr., for eight days. The small quantity of tannin not yet attacked at the end of this time was precipitated with gelatine, and the gallic acid with neutral acetate of lead. After standing for twenty-four hours, the complex precipitate was completely separated from the supernatant liquor, which was clear and colorless.

This liquor was tested with Soleil's polarising apparatus, but there was no sensible change in the color of the doubly rotating plate, clearly indicating that there was not the smallest quantity of sugar or of gum present. To be still more certain, I decomposed the acetate of lead contained in this solution with sulphuretted hydrogen, and after filtering it, carefully evaporated the clear liquor. There was no residue left after the evaporation, although I used 200 granmes of liquid.

Thus it would appear that tannin does not contain sugar nor gum, nor any other similar principle, in combination with the gallic acid. When, under the influence of the pectic fermentation, or of sulphuric acid, tannin is transformed into gallic acid, there occurs a simple molecular change, accompanied by hydration, just as cane sugar under the influence of yeast is transformed into grape sugar, before its conversion into alcohol and carbonic acid.

It remains for me to confirm this view of the subject by a minute analysis of all the tannates and gallates which can be obtained of constant composition.—*London Pharmaceutical Journal from Journal de Pharmacie.*

ON THE OCCURRENCE OF TANNIC ACIDS IN WOODY PLANTS, AND THEIR CONNEXION WITH THE FORMATION OF WOOD.

BY PROF. PETTENKOFER.

Some years since, Pettenkofer stated that wood vinegar contained pyrogallic acid. Further investigations have shown, that the pyrogenous acid contained in wood vinegar does not behave exactly like pyrogallic acid. Pettenkofer has now found the means of isolating the acid from the wood-vinegar.

The residue of the distillation of wood-vinegar is treated with a concentrated solution of chloride of sodium or of some other salt. The pyrogenous acid dissolves in this, whilst the intermixed resinous matters remain. The acid is then extracted by ether, which leaves it almost in a pure state on evaporation.

This acid is obtained not only by the dry distillation of bark, but also by that of wood; and the quantity of acid is not diminished even when the wood, before distillation, is very finely divided and treated with the usual solvents, even solution of potash.

Hence the author concludes, that this acid is produced from one of the insoluble matters of the wood, from some substance which no doubt stands in near relation to tannic acids, and which is perhaps produced from this in the course of vegetation, or, on the contrary, may furnish the material for its formation.

Starch and cellulose are not the sources of this pyrogenous acid, for straw, paper, and starch do not furnish it on distillation. It appears, therefore, that one of the substances incrusting wood furnishes the material for this pyrogenous acid.

A more extended investigation of the distribution of the tannic acids in the vegetable kingdom, which is not yet completed, has already led the author to the result that the tannic acids exist in perennial, but not in other plants, which certainly indicates a close connexion with the formation of wood. *Potentilla tormentilla* and *Solanum dulcamara*, which are perennial plants, contain tannin; the annual species, *Potentilla anserina* and *Solanum tuberosum*, contain none.—*Chem. Gaz.*, from *Buchner's Neues Repertorium*, iii. p. 74.

ON THE CONSTITUTION OF COAL-TAR CREOSOTE.

BY PROF. WILLIAMSON.

For some years past it has been a debated question among chemists, whether the peculiar body originally described by Reichenbach as creosote, and subsequently analysed by Ettling and others, has any real existence, or whether the properties which were attributed to it are not to be more correctly ascribed to the hydrate of phenyle, which can be obtained in a state of great purity from at least one sort of commercial creosote by mere distillation, and which possesses in an eminent degree the antiseptic properties for which creosote is remarkable.

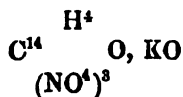
With a view of obtaining some light on this question, Mr. Fairlie undertook, in the laboratory of University College, an investigation of the portions of coal-tar creosote which boil higher than the hydrate of phenyle. The result of his experiments has been to show that a body homologous to hydrate of phenyle may be obtained from the crude creosote, in fact the next term of the series above hydrate of phenyle itself. Some qualities of commercial creosote

contain a greater quantity of this *hydrate of cresyle* (as it may be termed) than others; and it is most advantageously prepared from those portions which in the first distillation come over between 200° Cent. and 220°. After a great number of fractional distillations, a colorless, highly dispersive liquid is obtained, boiling at 203° Cent., and possessing the composition represented by the formula $C^{14}H^8O^2$.

This hydrate of cresyle resembles the corresponding phenyle compound in most of its properties; but it may be easily distinguished from that compound by its almost complete insolubility in aqueous ammonia.

When gradually mixed with sulphuric acid, it becomes of a beautiful rose-color, and gives rise to sulpho-cresylic acid.

The action of nitric acid upon hydrate of cresyle is very violent, and almost explosive if the acid is used in a concentrated state and at so high a temperature as the common atmospheric; even very dilute nitric acid transforms the compound into a brown tarry mass from which no definite substance can be extracted. By cooling some nitric acid in a frigorific mixture, and allowing some similarly cooled hydrate to fall into it drop by drop and with constant agitation, a red colored solution was obtained, which by dilution with water, and subsequent neutralization by potash, yielded a crop of short needle-shaped crystals of an orange-red color and possessing a greater solubility in water than the salt of carbazotic acid. This salt was found by analysis to possess the composition of a homologue of carbazotate of potash; so that it is the potash salt of a hydrate of cresyle in which three atoms of hydrogen are replaced by hyponitric acid,



The same acid was obtained by the action of nitric acid upon an alcoholic solution of the hydrate containing urea; but in attempting to repeat this experiment on a larger scale the mixture became hot, and the whole of the substance was destroyed with almost explosive violence.

When treated with pentachloride of phosphorus this hydrate of

cresyle is decomposed in like manner with the hydrate of phenyle, as described by Mr. Scrugham, yielding a chloride of cresyle and a phosphate of the same radical.

By the action of this phosphate in an alcoholic solution of acetate of potash, a peculiar oleaginous body is obtained, possessing an odor entirely different from that of the hydrate, and decomposable by potash with production of acetate and cresylate.

A similar reaction ensues when the phosphate is distilled with ethylate of potash, and a cresylate of ethyle is thus obtained.

In the numerous distillations which were performed for the purification of the hydrate of cresyle, some circumstances were observed which led to a suspicion that the body undergoes a change of composition, either through the distillation itself, or by some influences accompanying it. These circumstances were,—1st. A tarry residue, from a liquid which when introduced into the retort was perfectly colorless. 2nd. The formation of a small quantity of water in the commencement of such a distillation, though none was contained in the substance used. 3d. The gradual lowering of the boiling-point of the whole liquid by a great number of distillations. These facts, taken in conjunction, naturally suggested that the oxygen of the air contained in the retort might act upon the substance, and thus gradually reduce it to hydrate of phenyle.

In order to test the correctness of this hypothesis, the atmospheric air was expelled from the distilling apparatus by dry hydrogen gas, and the distillation performed in a pure atmosphere of this gas. A great number of distillations performed in this manner were at exactly the same temperature, and all the other anomalies were simultaneously removed. It was however found that the liquid always boiled at a lower temperature in hydrogen than in atmospheric air, the difference being about 2° Cent., and this without any alteration of the pressure on the surface of the boiling liquid. A similar fact was noticed in the distillation of hydrate of phenyle, and also of some other liquids.—*Chem. Gaz.*, Oct. 2, from *Proc. Royal Society*, June 15th, 1854.

THE ACTION OF IODIC ACID UPON THE VEGETO-ALKALIES.

(A communication made by R. H. BRETT, Esq., Ph. D. to the Liverpool Chemists' Associations, May, 1854.)

Dr. Brett said his attention was first drawn to the subject, by endeavoring to find out some test which should readily detect the presence of quinidine in quinine; on this point he had come to the conclusion that there was no decisive test, but knowing the peculiar action of iodic acid upon morphia, the production of a brown color from the liberation of iodine, he thought there might also be some reaction with quinine or any of the other alkaloids. Acting upon this impression he had made a number of experiments, which had resulted in showing most conclusively, he believed, that the reaction of iodic acid with nitrogenized vegeto-alkalies, was such as to distinguish them from all other organic substances. In the first place, he said, he would show its action upon a few of the alkaloids, and afterwards, its action upon other azotized and non-azotized substances, from both the vegetable and animal kingdoms, when a very marked difference in the results would be seen.

The doctor then placed a small portion of quinine in a capsule, and added about an equal portion of iodic acid, with a few drops of water. This mixture, on being gently heated, gave rise to a series of distinct explosions, accompanied by an evolution of gas, and it was to these explosions he wished to draw attention, for no other substance that he had experimented upon would produce them except the alkaloids. He repeated the experiment several times, substituting for the quinine, the alkaloids, strychnia, morphia and narcotine, and in each case with the same results. He then showed its action upon other—both azotized and non-azotized—substances, not alkaloids, such as meconic acid, salicine, uric acid, gluten, &c.; but there was no explosive action or the slightest appearance of detonation, merely a calm liberation of iodine vapor.

He observed, he had experimented with solutions of iodine itself, but without any result, though he would not insist upon this with much force, as only a few experiments had yet been made; but as far as they had gone no explosive action had been observed. He had also mixed iodic acid with ammonia, but with-

out any result. With regard to the theory of the decomposition which took place, and the cause of these explosions, his impression was that iodide of nitrogen was formed, but even its formation must be looked upon as an extraordinary circumstance, when we bear in mind the small quantity of nitrogen contained in these alkaloids; and what is more extraordinary still, the inability of any other nitrogenized body to produce the same reaction. If this explosive property should be shown to belong, by further experiment, as he had no doubt it would, exclusively to the alkaloids, it would be an important addition to our knowledge of these powerful medicinal agents; for instance, if we treat an unknown white substance with iodic acid, and get no explosion, we can say at once, that body is not one of the alkaloids, and as far as he had tried experiments upon the salts of the alkaloids, which were upon sulphate of quinine and muriate of morphia, he had found the reaction the same as upon the alkaloids themselves.—*Pharm. Jour.*, Nov. 1854.

ON THE PURIFICATION OF COAL NAPHTHA, AND OTHER VOLATILE HYDRO-CARBONS CONTAINING BENZINE.

By PROFESSOR CALVERT, OF MANCHESTER.

Professor Calvert finds that pure benzine and some of the volatile hydro-carbons obtained by the dry distillation of bituminous coals and shales, which also contain benzine, possess, to a high degree, the property of dissolving fatty or oily matters, and proposes to apply this property of benzine to various useful purposes.

In order to render the various products that contain benzine suitable for their several applications, he submits them to the following treatment, the object of which is to destroy or remove some of the carburetted hydrogens which are mixed with them, and which, not being sufficiently volatile, interfere with the application of benzine.

To effect this he takes coal and shale naphthas, preferring the limpid coal naphtha of commerce, and puts it into a suitable earthenware or leaden vessel, and adds to it sulphuric acid in small quantities until no more coloration is produced; consequently the quantity of acid employed will vary with the relative

degrees of purity of the coal or shale naphtha. The naphtha so treated is then washed with pure water or with a solution of an alkali, and submitted to distillation in an ordinary still. These operations are repeated until it is sufficiently pure for the various purposes to which it may be applied. For certain purposes on a large scale, it is only necessary to take a commercial coal naphtha and distil it at a temperature which does not exceed 212° Fahrenheit.

This benzine, or purified coal naphtha, is applicable to the removal of fatty or oily matters from animal and vegetable substances.—*Annals of Pharmacy*, Nov. 1854.

ON SPIRITUS ETHERIS NITROSI AND NITRIC ETHER.

By DR. F. MOHR.

When nitric acid, water and alcohol, are distilled with one another, a reaction ensues, in consequence of which the liquid continues to boil after the removal of the fire. The nitric acid is deoxidized; nitric oxide, the vapor of aldehyde, and carbonic acid, are evolved, and in the residue several oxygenated bodies, particularly oxalic acid, remain. The distillate contains, as the chief product, the ether of nitrous acid, which is commonly termed nitric ether. The nitrous ether is obtained from all proportions of alcohol, and nitric acid, particularly, by strong dilution. On the contrary, by strong concentration of the acid an explosive decomposition readily results, and, with strong excess of alcohol, the latter passes over in a pure condition. The preparation of nitric ether is divided into two parts, namely, its production and rectification.

The production of this ether ensues when nitric acid, alcohol, and water are heated, and the volatile products pass over themselves by the heat of the reaction. By these means it happens that the ether distils over as free as possible from alcohol, which does not occur when the formula of the Prussian Pharmacopœia is followed, as from the large quantity of strong spirit there ordered, the spirit passes over at first alone, and the formation of ether commences only when a large portion of the alcohol has already distilled over.

Mohr found, by experiments on the preparation of this ether,

that the employment of copper cuttings, recommended by Kopp, was serviceable, and gives the following directions for the preparation of the officinal ether.

Twenty-four ounces of spirit of wine, specific gravity, .833, are mixed with the same quantity of nitric acid, specific gravity 1.2, and then 4 ounces of copper cuttings are added. From the mixture 24 ounces are drawn over, which are mixed with a little tincture of litmus, and a solution of soda or potash is added gradually, until the distillate acquires a blue color. From this distillate 8 ounces are now drawn over and mixed with 16 of the strongest spirits of wine, by which the product equals the quantity of spirits originally used. The preparation thus obtained free from acid should be kept in two or three ounce bottles quite full. This spirit of nitric ether is of a slight yellow color, extremely powerful, and of a pure odor, and in all cases more so than pure spirit of wine.

The Prussian Pharmacopœia requires a spirit of nitric of specific gravity .820—.825. This is a great error, because, in consequence, the spirit of nitre is unquestionably deteriorated. When the pharmacist obtains a product which has not this specific gravity, he can only produce it by the addition of strong spirit, by which the contents of nitric ether are diminished.

Further, when, according to the Pharmacopœia, nitric acid, diluted with eight times its quantity of alcohol, is distilled, pure spirit of wine at first passes over, and only towards the end the yellow strongly odorous product comes over. But, on the contrary, when the distillate is rectified, the latter goes over at first, and the spirit of wine at last; therefore it is incomprehensible why the Pharmacopœia directs the first ounce to be rejected.

From these circumstances, Mohr concludes that it is very fallacious to remove the small quantity of free acid, which the ether always exhibits after a time, by repeated rectification, as the changes which spirit of nitre thereby undergoes occasion much more evil consequence than that which arises from the presence of a little free acid.

In the officinal spirit of nitre, the nitric ether is obtained mixed with alcohol and water. In the distillate obtained from copper so much nitric ether is obtained, that when this is once rectified, and one-third drawn over, from this third part the

nitric ether can be separated by agitation with a solution of chloride of calcium. From 48 ounces of spirit of wine 8 ounces of nitric ether may be separated in this way, which rectified over dry chloride of calcium will give pure nitric ether. The yellow color depends upon a body mixed with the ether, which cannot be removed by rectification over sugar, as stated by Couerbe, but a portion may be obtained colorless by fractional distillation.

The ether of specific gravity .898 begins to boil at 63.5° Fahr., and boils completely at 64.4°. Nitric ether is the only ether which is obtained considerably in a diluted watery fluid, and the only one which is not formed in a concentrated fluid, by the power of muriatic acid or sulphuric acid to abstract water, and, moreover, the only one which results by a decomposition of its acid, and simultaneously with the oxidation of the alcohol. The latter abnormality does not happen when nitrous acid, instead of nitric acid, is directly employed. Nitric ether prepared according to Kopp's method, and the previously known ones, always contains aldehyde. By its decomposition with caustic potash or soda this liquid acquires a brown red color. Nitrous ether can be kept for months in contact with potash, without undergoing decomposition; but the author has again obtained the alcohol by the treatment of this ether with potash ley in closed tubes; nevertheless, he infers that it cannot be regarded as the nitrate of ethyl-oxide, but must be considered as $\text{NC}_4\text{H}_5\text{O}_4$.—*Annals of Pharmacy, from Buchner's Repertorium.*

ON EMULSIONS OF THE GUM-RESINS AND RESINS.

By M. CONSTANTIN.

Up to the present time the gum-resins and resins have been but rarely employed, on account of the difficulty of mixing them with liquids for administration. The purification of these substances, even by means of vinegar or alcohol, has been rejected; for, as Lemery very justly remarks, it is preferable to choose gum-resins and resins free from impurities, than to purify them by any means whatever. In Pharmacy we have only the alcoholic solutions of gum ammoniacum and assafœtida, and the alcoholic and ethereal solutions of tolu, which substances I have most carefully examined, and all of which, when added to an aqueous liquid, very

rapidly separate, the resins floating and uniting on the surface of the liquid. But when, as is frequently the case, we have to prepare a mixture or injection containing any of the gum-resins, gum ammoniacum or assafœtida, for instance, or a resin, more especially that of tolu, which mixes very incompletely, it is, I think, of some importance to obtain a more ready and advantageous process for their admixture than any of those hitherto employed for this purpose. Among those mentioned in works on Pharmacy we find the use of mucilage, or what is preferable, the yolk of egg; but these means, although very good in themselves, become tedious when adopted in hospitals, where, in a short space of time, a large number of mixtures have to be prepared; and even when yolk of egg is used, the resins above mentioned are frequently but imperfectly mixed.

Having frequently had occasion to see the gum-resins prescribed, and among them that of assafœtida, which, as is known, is a very energetic medicine, I endeavored to find some means of shortening the process of trituration; and I think that the process I am about to describe will be a considerable saving in point of time, and also be more efficacious for mixing the gum-resins and even the resins. The gum-resins will, in the first instance, claim attention, for the remarks I have to make on the resins are but a confirmation of the first-named process.

Having been called upon on several occasions to prepare mixtures and injections in which gum ammoniacum and assafœtida were used, the following was the method I employed for their preparation:—

I place the quantity of gum-resin prescribed, in small pieces, in a marble or porcelain mortar, and add about four times its weight of alcohol. I then ignite the alcohol and triturate the whole with a porcelain pestle until the alcohol has all burned away. The gum-resin acquires the appearance of a soft extract. The liquid is now added in small quantities at a time, and a perfectly homogeneous emulsion is produced, from which no separation takes place on standing, and in which the gum-resin is very completely distributed, a result which it is difficult to ensure when yolk of egg is used, even after long trituration. In this way the gum-resin is presented to the absorbent surfaces of the stomach

and intestines more effectually than it would be in the form of pill, and the action of the medicine is therefore more certain.

When the quantity of gum-resin prescribed is very large, the addition of yolk of egg will improve the emulsion, by preventing reunion of the resinous portion. A small quantity of powdered gum-arabic might also be added to the gum-resin after the combustion of the alcohol has ceased, in order to render the emulsion more perfect, but this would generally be an unnecessary precaution.

The resins afford results equally satisfactory. It is only necessary to add to them what they require to convert them into gum-resins, and powdered gum-arabic answers this purpose. To the resin, balsam of tolu, for instance, twice its weight of gum-arabic is to be added, not forgetting the alcohol in the same dose as before, the mode of operating being also the same as for gum-resins. Balsam of tolu may be thus perfectly suspended, forming an emulsion, the taste of which is very agreeable, and has nothing repugnant to the patient.

As these processes are not described in any work on Pharmacy, I thought they might be deemed worthy of the notice of Pharmacutists, being simple and expeditious, and affording satisfactory results.

The heat produced by the combustion of the alcohol over the gum-resins and resins, is not sufficient sensibly to alter the qualities of the product, for although some of the aromatic principles of the medicine must be volatilized, the quantity appears to be very small, the peculiar taste and odor remaining apparently undiminished in the emulsion. The loss must be considered as almost nothing.—*London Pharm. Jour., from Journal de Pharmacie.*

ON THE PREPARATION AND USE OF PERCHLORIDE OF IRON.

By M. GOSLEY.

Perchloride of iron had been almost abandoned as a therapeutic agent, when M. Pravaz, a distinguished surgeon at Lyons, proposed a new mode of applying it in the treatment of aneurism and varicose veins, which consists in injecting into the arteries or veins a few drops of a concentrated solution of the salt.

Under the influence of this liquid all the blood within a distance of three or four centimetres is converted in a few minutes into a solid clot. This new mode of treatment, however, is only now being tested.

It has not yet been determined what is the real mode of action of perchloride of iron in the blood. According to some, it coagulates the whole of the blood and all its elements. According to others, it acts only on the fibrine, and others again contend that its action is confined to the albumen.*

It still remains to be shown what is the nature of the clot, whether the perchloride is a simple hemostatic or a hemospasic, whether it acts as an irritant caustic or as a toxic agent, and, moreover, what is the maximum dose that can be safely applied.

It will be seen from these questions, which have been recently discussed in the Academy of Medicine, that some importance attaches to the preparation of perchloride of iron. M. Burin de Buisson, who made, with M. Pravaz, the first experiments with the new mode of treatment to which reference has been made, prepared in the following manner the chloride which they used. Peroxide of iron, previously heated to redness, was digested without heat for five or six hours with colorless and pure hydrochloric acid; the mixture was then heated over a water-bath, until about two hundred parts of the oxide were dissolved in 1000 parts of acid. The process should be conducted with a porcelain capsule the weight of which is known. The liquid having been decanted from the undissolved oxide was carefully evaporated over a water-bath, stirring it continually until it acquired the consistence of a thick syrup, the weight of which was determined. This was mixed with half its weight of distilled water, heated for a short time, and then filtered. The capsule and filter were washed with a quantity of water equal to that previously used, and the whole subsequently brought to the density of 43.5° or 44° .

The chloride prepared in this way is subject to the objection

* M. Burin du Buisson has ascertained that ten drops of solution of perchloride of iron, of 45° , added to the white of an egg diluted with thirty grammes of water causes the whole to become, in fifteen seconds, a mass which, on inverting the vessel in which it is contained, remains adhering to the sides, and will not fall out for some time.

of its retaining too much free hydrochloric acid. If, instead of stopping the evaporation at the point indicated by M. Burin du Buisson, it be continued for a longer time, it becomes still more acid. It is known also how difficult it is to keep for any length of time a solution of perchloride of iron with the deposition of insoluble oxychloride and the development at the same time of free acid in the solution.

In order to obviate these objections, M. Burin du Buisson proposed, in a new memoir addressed to the Academy of Sciences, to substitute the following process for that already described :

Pure hydrochloric acid is to be saturated as far as possible with hydrated peroxide of iron ; the solution is evaporated over a water-bath, taking care to remove the aqueous vapors, as I had before indicated, as these cause the formation of hydrochloric acid and the deposition of oxychloride of iron. When the liquid has thus acquired the consistence of a thick syrup (in this state it crystallizes on being cooled, without, however, assuming a solid mass), the evaporation is stopped, and an excess of gelatinous hydrated peroxide of iron mixed with a little water is added ; they are stirred together for a quarter of an hour, and then allowed to stand for several hours. Sufficient distilled water is added to make the density equal to 30° Baumé, and it is then left in contact with excess of hydrated oxide for eight days when it is filtered, and again allowed to stand for fifteen days. The density of 20° Baumé, is that which MM. Valette, Desgranges, and Petrequin prefer for the treatment of varicose veins. For aneurisms these surgeons think it is sufficient to employ a solution at 20° or even 15°.

This new mode of preparing the ferric solution has no material advantage over the former. The contact of the liquor with hydrated oxide of iron does not remove free hydrochloric acid so effectually as evaporation, as M. Burin du Buisson has himself admitted. It is known that solution of perchloride of iron, even when made from the sublimed chloride, has always an acid reaction.

If it be impossible to prepare a solution of perchloride of iron without its being acid, and if it be important that it should be as little acid as possible, would it not be preferable to have recourse to the chloride of iron prepared by the process which I

described in 1844.* The ferric solution would then be a preparation which the surgeon could prescribe of any strength he may desire. The dry chloride may be kept for a long time without change; it forms a clear solution with water; which also may be kept for a long time without any sensible alteration. The chloride of iron prepared from hematite (according to M. Goble's process referred to) is chemically more pure and more surely uniform than that made from the hydrated oxide. It also contains a smaller quantity of free acid. I believe, indeed, that it contains but a mere trace. If, in preparing it, the evaporation be continued beyond the point at which it becomes solid on cooling, I have observed that it decomposes into hydrochloric acid and oxychloride of iron. The solution which Mr. Burin du Buisson now prefers to use is but slightly acid when recently prepared, but it becomes more acid after being kept, from the deposition of oxychloride. It is true that, according to him, it is this excess of acid that prevents a further deposition of oxychloride, but in order to prevent the acidity of the liquor, would it not be better to employ a solution made extemporaneously from the dry chloride?

There is, it is true, one difficulty in the employment of the dry salt, namely, that the quantity of the solution required for an operation is always very small, but I have surmounted this difficulty by determining from experiment the proportions of perchloride of iron and water necessary to form solutions of the strength required for surgical purposes.

The following are the proportions for making solutions of certain densities indicated according to Baumé's hydrometer:—

Chloride.	Water.	Density of solution.
53.85	46.15	45°
34.65	65.35	30°
21.30	78.70	20°
16.35	83.65	15°

The dry chloride contains about a fifth of its weight of water; it is, therefore, always easy to calculate the quantity of anhy-

* This process is described at length in vol. iv., page 24, of the *Pharmaceutical Journal*.

drous chloride in the solutions. Thus those of the densities, indicated by 45° , 30° , 20° , and 15° respectively, contain 43.10,—29.70,—17.05,—12.10 per cent.—*Pharm. Jour.*, from *Journal de Pharmacie*.

ON THE MODE OF PREPARATION OF THE OLEA COCTA.

(TRANSLATED BY J. M. MAISCH.)

The so-called olea cocta, like several ointments, are prepared according to some Pharmacopœias, of even recent edition, from the fresh herbs, by boiling them with oils or lard until all moisture be evaporated. L. Hermite (*J. de Pharm. et de Chim.* Nov. 1853, 349) remarks correctly that this practice embraces all the unfavorable conditions. The oil or fat, being exposed at the same time to a heat of at least 212° and the vapors of water, often for several hours, is very apt to spoil; even the herbs, which cannot become saturated with the oil before the water is entirely driven off, suffer a change; by the coagulation of the albumen in the juice, the other matters to be extracted will be enveloped and prevented from receiving the solvent action of the fats, at least partly; and from the fresh herbs these preparations cannot be made at all seasons.

Two phases must be distinguished in this mode of preparation from the fresh herbs: 1st, the drying of the vegetables within a heated liquid; and 2nd, the digestion of the same in the same liquid. It is only in the second period that the oil has really a useful action upon them, the first period may advantageously be replaced by previously drying the herbs in open air, when they will better retain their peculiar properties, and the necessity be removed of heating the fat too long and to too high a degree.

L. Hermite has prepared several oils and ointments for comparison, from fresh and from dried herbs, the quantity of the last being that obtained from the given quantity of the first, after the drying process. In all cases the dry herbs have made a much better preparation, as far as could be judged from the external appearance. It is advantageous to put the air-dry herbs for an hour in the drying room before extracting them with oil. Then they become so friable that by rubbing them between

the fingers they may be easily reduced to a coarse powder, which readily absorbs the oil. In the heat of the water bath all the oil soon becomes green, and when after one or two hours, according to the quantity employed, the fat has extracted all color, the operation may be looked on as finished. In this manner the olea cocta, which ought to be called now olea infusa, are prepared by the Pharm. Wurttemb., and as we understand the Pharm. Bavaria, which is to be published in a short time, will adopt the same process.

Some pharmacutists have chosen to obtain these oils by displacements from the dry herbs. E. Krause (*Zeitschr. J. Pharm.* 1853, No. 7,) reduces the herb, previously dried in a moderate heat, to a coarse powder, moistens it with strong alcohol, in sufficient quantity to press it down, and after letting it stand full a day, well covered, transfers it to a percolator, pouring upon it the right quantity of oil. After the oil has been all absorbed by the powder, he puts a layer of washed sand on top, to displace by water the last quantity of oil, taking care, however, not to get it mixed with the aqueous extractive matter. Thus prepared the oil has the odor of the herb in a high degree, is of a dark brownish green color, and keeps very long without getting rancid.

It is unnecessary to heat the oil, to drive off the alcohol, as after standing it collects on the bottom, and serves to keep the oil from becoming rancid. Small quantities, such as oleum cantharides for ung. canthar. may be prepared in the same way in a suitable funnel. Oil of cantharides is said to become stronger and better if ether or chloroform be used for moistening in place of alcohol.

A similar formula was published by H. Gerste (*Zeitschr. J. Pharm.* 1854, No. 3). One pound troy he moistens with 6 oz. spir. vini rect., and then gradually pours on the necessary quantity of oleum olivarum; the obtained oil is to be heated for a short time in the steam apparatus, till all the alcohol has evaporated and the oil is clear.—*Buchner's N. Repert.* 1854, 223-225.

ON THE PREPARATION OF INULIN.

(TRANSLATED BY J. M. MAISCH.)

C. J. Thirault (*Journ. de Pharm. et de Chim.* 3 Sér. xxv. 205) remarks on that subject the following:

"It is difficult to obtain Inulin perfectly white and in any considerable quantity. By heating elecampane with boiling water, concentrating the liquor by evaporation to separate the inulin, and treating it several times with charcoal, it may be obtained sufficiently white, but charcoal absorbs a considerable quantity of it."

Much easier it may be isolated in the following way: Elecampane is exhausted by displacement with boiling water in order to obtain a saturated solution and to shorten the evaporation. After sufficient concentration, the double volume of alcohol of 81° (alcoholmeter) is added, precipitating the inulin nearly white. If this be dissolved in a little distilled water, the liquor treated with a small quantity of washed animal charcoal, and again mixed with double its volume of alcohol of 81°, a white precipitate of inulin is obtained, which, being impregnated with alcohol, will dry in a short time.

This method is, notwithstanding the use of alcohol, a profitable one, the alcohol not being lost, but becoming merely diluted.—*Erdmann's Journal* lxii., 253.

ON THE PRESENCE OF GLUCOSE IN OPIUM, LACTUCARIUM, THRIDACE, AND IN THE VEGETABLE KINGDOM IN GENERAL. Ry MAGNES LAHENS, Pharmaceutist of Toulouse.

The author, in the course of an investigation into the composition of commercial opium, met with Landerer's statement that *glucose* is often found in that drug, and is due to the grape juice employed by the Orientals to adulterate it, as he had himself witnessed.

Desiring to ascertain if certain specimens of opium in his possession likewise contained sugar, he submitted fourteen samples to the test by Barreswil's method, and detected it in all of them. He could not believe that they were sophisticated, especially

those known to be rich in morphia, and determined to study them more closely.

It naturally occurred to Mr. Lahens to inquire whether poppy heads do not contain glucosé among their constituents? and he found it very soon in the alcoholic extract of the poppy, as well as in the dry and recent poppy heads, notwithstanding that no allusion had been made to its presence before in these, or in opium, where it has probably been confounded with extractive matter.

His experiments do not disprove Landerer's statement, but show that at least a part of the sugar is properly present, and is therefore a sufficient problem to decide how much of the glucose is derived from the poppy. He therefore tested quantitatively the fourteen specimens of opium before noticed, besides four samples of indigenous opium, with the following results, viz :—

No. 1.	Egyptian opium	contained	6.9	of Glucose.
" 2.	Smyrna do.	do.	8.0	do.
" 3.	" do.	do.	7.2	do.
" 4.	" do.	do.	7.1	do.
" 5.	" do.	do.	7.6	do.
" 6.	Constantinople opium	do.	14.5	do.
" 7.	" do.	do.	4.3	do.
" 8.	" do.	do.	7.6	do.
" 9.	" do.	do.	10.0	do.
" 10.	" do.	do.	7.5	do.
" 11.	" do.	do.	8.4	do.
" 12.	" do.	do.	6.4	do.
" 13.	" do.	do.	8.0	do.
" 14.	Opium of uncertain origin	do.	3.0	do.
" 15.	Indigenous French opium	do.	6.5	do.
" 16.	" do.	do.	7.5	do.
" 17.	" do.	do.	7.0	do.
" 18.	" do.	do.	8.0	do.

The author remarks that specimens 6, 7, and 14 had been previously found deficient in morphia, and that 7 and 14 bore evident marks of having been remade.

Setting aside the results for these three specimens for the present, it follows :

1st. That the foreign opiums contain nearly an equal proportion of glucose, and that the mean is between 7 and 8 per cent.

2nd. That the mean proportion of glucose in the indigenous specimens was 7.25 per cent.

He therefore infers that the sugar in the specimens 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 13, is essential to them and not fraudulently added, and as a corollary to this proposition, he considers that all opium which contains much more or much less of glucose than 7 to 8 per cent. ought to be suspected.

The specimens 6, 7, and 14 also support this view, as in the first, glucose has been added as an adulteration, whilst the other two have been remade with other materials.

The analogy between the juices of the poppy and lettuce induced the author to test lactucarium, which on trial he found to contain between 8 and 9 per cent of glucose; and on testing the *thridace* of the shops, he found the proportion of glucose as high as 18 to 20 per cent., which he thinks is one of the causes of its extreme deliquesence.

Mr. Lahens afterwards sought for this variety of sugar in other plants and vegetable products, and the results obtained, though not complete, lead to the belief that it occurs much more generally than has been supposed.

In order to ascertain whether any other ingredient in opium would react with the sugar test so as to cause deception, the author made a series of experiments. First, all the proximate principles of opium were successively put in contact with the test liquid, without any reducing effect. Secondly, one hundred grammes of an aqueous solution of opium was evaporated to dryness, and the dry extract redissolved in water to make 100 grammes. The latter tested with Barreswil's solution gave the same indication as the first, showing that no volatile ingredient was present as the reducing agent. Thirdly, a solution of specimen No. 2 was treated with well-washed yeast, and the resulting liquid yielded alcohol by distillation. Fourthly, he obtained a syrupy liquid from the liquor from which morphia had been precipitated, which, though impure, possessed two thirds of the reducing power of syrup of starch.

The test liquid used was made as follows :—

Take of Caustic potash,	60 parts.
Neutral tartrate of potassa,	40 do.
Distilled water,	200 do.

Dissolve ; and then

Take of Sulphate of copper	65 do.
Distilled water,	500 do.

Dissolve and mix with the preceding liquid.

Mr. Lahens applies this test to opium by exhausting five grains of the latter with sufficient water to make 50 grains of solution, then places five cubic centimetres of the test liquid in a porcelain capsule, heats it to ebullition, by a small alcohol lamp, and then drops in the opium solution slowly from a graduated burette, so as not to stop the ebullition or increase the liquid above the primitive level. As soon as the liquid acquires a reddish yellow color, the addition should cease, and the number of measures of the solution of opium consumed indicates the amount of sugar present.—*Jour. de Pharm. Oct. 1854.*

ON THE OLEATES OF THE ORGANIC ALKALIES.

By M. L. HERMITE.

The author in a paper published in the *Journal de Pharmacie* for Oct. 1854, proposes as a substitute for the oleaginous and glycerinic solutions of the organic alkaloids, recently proposed as liniments, solutions of these bases in *oleic* acid. He objects to the oils from their incapability of dissolving the alkaloids, and to the glycerin from its not possessing unctuous properties.

Oleic acid dissolves the organic alkaloids and their salts perfectly. This acid can be procured without any disagreeable odor, and can easily be aromatized with essences. Its acidity is not so decided as to be of any account in its application to this use. It is sufficient to triturate the alkaloid with a little of the oleic acid to divide it, and then add the rest. The proportion varies with the activity of the substance. The following recipes are given :

Oleate of Morphia.

Take of Purified Oleic Acid,	an ounce.
Morphia in powder,	1½ grain.
Essence of Bergamot,	6 drops.

Mix as above.

It does not do to dilute a solution of morphia in oleic acid with olive oil, as it occasions a precipitate.

Oleate of Quinia.

Take of Sulphate of Quinia in powder,	a drachm.
Oleic Acid, aromatized,	10 drachms.

Dissolve by the aid of a gentle heat.

Oleate of Veratria.

Take of Veratria in powder,	6 grains.
Oleic Acid,	an ounce.

Dissolve.

Oleate of Strychnia.

Take of Strychnia in powder,	3 to 15 grains.
Oleic Acid,	10 drachms.

Dissolve.

Oleate of Atropia.

Take of Atropia,	3 to 15 grains.
Oleic Acid,	10 drachms.

Dissolve.

These oleates will serve for the preparation of ointments, solidifying them with either stearic acid or a mixture of stearic and margaric acids, as wax or suet, will not answer, as they precipitate the alkaloids. Stearic and margaric acids, (such as are used for candles,) will, when melted, dissolve the vegetable bases, of which the following examples may be given.

Oleic Ointment of Quinia.

Take of Sulphate of Quinia,	a drachm.
Oleic Acid,	7½ drachms.
Stearic Acid, (of candles,)	2½ drachms.

Fuse and dissolve.

Oleic Ointment of Veratria.

Take of Veratria,	six grains.
Oleic Acid,	six drachms.
Stearic Acid,	two drachms.

Fuse and dissolve.

Oleic acid is also as good a solvent as the oils for resinous matters and the volatile oils, and having the faculty, also, of dis-

solving the organic bases and their salts, it will replace them in the preparation of narcotic oils, and particularly the *Baume Tranquille*, which I have made with much success with oleic acid.

Varieties.

On Perfumery. BY SEPTIMUS PIESSE.

Continued from page 564.

PERFUMES OF ANIMAL ORIGIN.

In the previous articles we have only spoken of the odors of plants; we now enter upon those materials used in perfumery of an animal origin. The first under our notice is—

AMBERGRIS.—This substance is found in the sea, floating near the islands of Sumatra, Molucca and Madagascar; also on the coasts of America, Brazil, China, Japan and the Coromandel. The western coast of Ireland is often found to yield large pieces of this substance. The shores of the counties of Sligo, Mayo, Kerry, and the isles of Arran, are the principal places where it has been found. In the "Philosophical Transactions" there is an account of a lump found on the beach of the first-mentioned county, in the year 1691, which weighed 52 oz., and was bought on the spot for 20*l.*, but which afterwards was sold in London for more than 100*l.* (Philos. Trans., No. 227, p. 509.) We are quite within limit in stating that many volumes of matter concerning the origin of ambergris have been written, but the question respecting it is still at issue. It is found in the stomachs of the most voracious fishes, these animals swallowing, at particular times, everything they happen to meet with. It has been particularly found in the intestines of the spermaceti whale, and most commonly in sickly fish, whence it is supposed to be the cause or effect of the disease.

Some authors, and among them Robert Boyle, considers it to be of vegetable production, and analogous to amber; hence its name *ambergris*, (grey) grey amber. It is not, however, within the province of these articles to enter into any dissertation of the various theories about its production, which, were it of any importance, could probably be satisfactorily explained if our modern appliances were brought to bear upon the subject. The field is open to any scientific enthusiast; all recent authors mentioning it, merely quoting the facts known more than a century ago.

A modern compiler, speaking of ambergris, says, "It smells like dried cow-dung." Never having smelled the latter substance, we cannot say whether Mr. Redwood's simile be correct, but we certainly consider that

its perfuming value is most incredibly overrated; nor can we forget that HOMBERG found that "a vessel in which he had made a long digestion of the human fæces had acquired a very strong and perfect smell of ambergris, insomuch that any one would have thought that a great quantity of essence of ambergris had been made in it. The perfume (*odor*!) was so strong that the vessel was obliged to be moved out of the laboratory." (Mem. Acad. Paris, 1711.)

Nevertheless, as ambergris is extensively used as a perfume; in deference to those who admire its odor, we presume that it has to many an agreeable smell.

Like bodies of this kind undergoing a slow decomposition and possessing little volatility, it, when mixed with other very fleeting scents, gives permanence to them on the handkerchief, and for this quality the perfumer esteems it much.

ESSENCE OF AMBERGRIS.

Rectified spirit	1 gallon.
Ambergris	6 ounces.

After standing together for three weeks or a month, it is fit to strain off. This essence of ambergris thus made is not sold retail; it is only kept for mixing when the retailed has to be sweetened up to the public nose; it is then called after the Parisian name

EXTRAIT D'AMBRE.

Espirit de rose triple	$\frac{1}{2}$ pint.
Extract of ambergris	1 pint.
Essence of musk	$\frac{1}{2}$ pint.
Extract of vanilla	2 ounces.

This perfume has such a lasting odor, that a handkerchief being well perfumed with it, will still retain an odor even after it has been washed.

The fact is, that both musk and ambergris contains a substance which clings pertinaciously to woven fabrics, and not being soluble in weak alkaline leys, is still found upon the material after passing through the laboratory ordeal.

Powdered ambergris is used in the manufacture of cassolettes—little ivory or bone boxes perforated—which are made to contain a paste of strong smelling substances, to carry in the pocket or reticule; also in the making of peau d'espagne, or Spanish skin, used for perfuming writing paper and envelopes, and which will be described hereafter.

CIVET.—This substance is secreted by the *Viverra civetta*, or civet cat. It is formed in a large double glandular receptacle between the anus and the pudendum of the creature. Like many other substances of Oriental origin, it was by the enterprise of the Dutch first brought to this country.

When the civet cats are kept in a state of confinement, which at one time was common in Amsterdam, they are placed in strong cages, so constructed

as to prevent the animal from turning round and biting the person employed in collecting the secreted substance. This operation is said to be performed twice a week, and is done by scraping out the civet with a small spoon; about a dram at a time is thus obtained. A good deal of the civet now brought to European markets is from Calicut, capital of the province of Malabar, and from Bassora on the Euphrates.

In its pure state, civet has, to nearly all persons, a most disgusting odor; but when diluted to an infinitesimal portion, its perfume is agreeable. It is difficult to account for the reason why the same substance, modified only by the quantity of matter presented to the nose, should produce an opposite effect on the olfactory nerve; but such is the case with nearly all odorous bodies, especially with essential oils, which, if smelled at, are far from nice, and in some cases positively nasty—such as oil of neroly, oil of thyme, oil of patchouly; but if diluted with a thousand times its volume of oil, spirit, &c., then their fragrance is delightful.

Otto of rose to many has a sickly odor, but when eliminated in the homœopathic quantities, as it rises from a single rose bloom, who will not admit that “the rose is sweet?” The odor of civet is best imparted, not by actual contact, but by being placed in the neighborhood of absorbent material; thus, when spread upon leather, which, being covered with silk and placed in a writing-desk, perfumes the paper and envelopes delightfully, and so much so, that they retain the odor after passing through the post.

EXTRACT OF CIVET is prepared by rubbing in a mortar one ounce of civet with an orris-root powder, or any other similar material that will assist to break up or divide the civet; and then placing the whole in a gallon of rectified spirits; after macerating for a month, it is fit to strain off. It is principally used as a “fixing” ingredient, in mixing essences of delicate odor. The French perfumers use the extract of civet more than English manufacturers, who seem to prefer extract of musk. From a quarter of a pint to half a pint is the utmost that ought to be mixed with a gallon of any other perfume.

CASTOR is a secretion of the *Castor fiber*, or beaver, very similar to civet. Though we have often heard of its being used in perfumery, we do not personally know that such is the case.

MUSK.—This extraordinary substance, like civet, is an animal secretion; it is contained in excretory follicles about the navel of the male animal. In the perfumery trade these little bags are called “pods,” and as imported it is called “pod musk.” When the musk is separated from the skin or sack in which it is contained, it is then called “grain musk.”

The musk deer (*Moschus moschiferus*) is an inhabitant of the great mountain range which belts the north of India, and branches out into Siberia, Thibet and China. It is also found in the Altaic range, near Lake Baikal, and in some other mountain ranges, but always on the line of perpetual snow. It is from the male animal only that the musk is produced.

It formerly was held in high repute as a medicine, and is still so among Eastern nations. The musk from Boutan, Tonquin and Thibet, is most esteemed, that from Bengal is inferior, and from Russia is of still lower quality. The strength and the quantity produced by a single animal varies with the season of the year and the age of the animal. A single musk pod usually contains from two to three drachms of grain musk. Musk is imported into England from China, in caddies of from 50 to 100 ounces each. When adulterated with the animal's blood, which is often the case, it forms into lumps or clots; it is sometimes also mixed with a dark, friable earth. Those pods in which little pieces of lead are discovered, as a general rule, yield the finest quality of musk; upon this rule, we presume that the best musk is the most worthy of adulteration. Musk is remarkable for the diffusiveness and subtlety of its scent; everything in its vicinity soon becomes affected by it, and long retains its odor, although not in actual contact with it.

It is a fashion of the present day for people to say that "they do not like musk," but, nevertheless, from great experience in one of the largest manufacturing perfumatories in Europe, we are of opinion that the public taste for musk is as great as any perfumer desires. Those substances containing it always taking the preference in ready sale—so long as the vendor takes care to assure his customer "that there is no musk in it."

The perfumer uses musk principally in the scenting of soap, sachet powder, and in mixing for liquid perfumery. The just reputation of Paris's original Windsor soap is due, in the main, to its delightful odor. The soap is, doubtless, of the finest quality, but its perfume stamps it among the *élite*—its fragrance it owes to musk.

The alkaline reaction of soap is favorable to the development of the odoriferous principle of musk. If, however, a strong solution of potash be poured on to grain musk, ammonia is developed instead of the true musk smell.

EXTRACT OF MUSK.

Grain musk	2 ounces,
Rectified spirit	1 gallon.

After standing for one month, at a summer temperature, it is fit to draw off. Such an extract is that which is used for mixing in other perfumes. That extract of musk which is prepared for retail sale, is prepared thus:—

EXTRAIT DE MUSC.

Extract of musk (as above)	1 pint.
" ambergris	$\frac{1}{2}$ pint.
" rose triple	$\frac{1}{2}$ pint.

Mix and filter; it is then fit for bottling.

This preparation is sweeter than pure extract of musk made according to our first formula, and is also more profitable to the vendor. It will be seen hereafter that the original extract of musk is principally used for a

fixing ingredient in other perfumes, to give permanence to a volatile odor. Customers requiring, in a general way, that which is incompatible, namely, that a perfume shall be strong to smell, *i. e.*, very volatile, and that it shall remain upon the handkerchief for a long period, *ergo*, not volatile! Small portions of extract of musk, mixed with esprit de rose, violet, tuberose, and others, do, in a measure, attain this object; that is, after the violet, &c., has evaporated, the handkerchief still retains an odor, which, although not that of the original smell, yet gives satisfaction, because it is pleasant to the nasal organ.

AMMONIA.—Under the various titles of “Smelling Salts,” “Preston Salts,” “Inexhaustible Salts,” “Eau de Luce,” “Sal Volatile,” ammonia, mixed with other odoriferous bodies, has been very extensively consumed as material for pleasuring the olfactory nerve.

The perfumer uses liq. amm. fortis, that is, strong liquid ammonia, and the sesqui-carbonate of ammonia, for preparing the various “salts” that he sells. These materials he does not attempt to make; in fact, it is quite out of his province so to do, but, he procures them ready for his hand through some manufacturing chemist. The best preparation for smelling-bottles is what is termed **INEXHAUSTIBLE SALTS**, which is prepared thus:—

Liquid ammonia	.	.	.	.	1 pint.
Essential oil of rosemary	.	.	.	.	1 drachm.
“ “ English lavender	.	.	.	.	1 drachm.
“ “ bergamot	.	.	.	.	$\frac{1}{2}$ drachm.
“ “ cloves	.	.	.	.	$\frac{1}{2}$ drachm.

Mix the whole together with agitation in a very strong and well-stoppered bottle.

This mixture is used by filling the smelling-bottles with any porous absorbent material, such as asbestos, or what is better, sponge cuttings, that have been well beaten, washed, and dried. These cuttings can be procured at a nominal price from any of the sponge-dealers, being the trimming or roots of the Turkey sponge, which are cut off before the merchants send it into the retail market. After the bottles are filled with the sponge, it is thoroughly saturated with the scented ammonia, but no more is poured in than the sponge will retain, when the bottles are inverted; as if by any chance the ammonia runs out and is spilt over certain colored fabrics, it causes a stain. When such an accident happens, the person who sold it is invariably blamed.

When the sponge is saturated properly, it will retain the ammoniacal odor longer than any other material; hence, we presume, bottles filled in this way are called “inexhaustible,” which name, however, they do not sustain more than two or three months with any credit; the warm hand soon dissipates the ammonia under any circumstances, and they require to be refilled.

For transparent colored bottles, instead of sponge, the perfumers use what they call insoluble crystal salts (sulphate of potass). The bottles

being filled with crystals, they are covered either with the liquid ammonia, scented as above, or with alcoholic ammonia. The necks of the bottles are filled with a piece of white cotton, otherwise, when inverted, from the non-absorbent quality of the crystals, the ammonia runs out, and causes the same complaint to be made. The crystals look prettier in colored bottles than the sponge; but in plain bottles the sponge appears quite as handsome, and, as before observed, it holds the ammonia better than any other material. We have also what is called **WHITE SMELLING SALTS**, and **PRESTON SALTS**. The White Smelling Salt is the sesqui-carbonate of ammonia in powder, with which is mixed any perfuming essential oil that is thought fit,—lavender oil giving, as a general rule, the most satisfaction.

PRESTON SALTS, which is the cheapest of all the ammoniacal compounds, is composed of some easily decomposable salt of ammonia and lime, such as equal parts of muriate of ammonia, or of sesqui-carbonate of ammonia, and of fresh slaked lime. When the bottles are filled with this compound, rammed in very hard, a drop or two of some cheap essential oil is poured on the top prior to corking. For this purpose, oil of French lavender, or oil of bergamot, answers very well. We need scarcely mention that the corks are dipped into melted sealing-wax, or brushed over with liquid wax, red or black wax dissolved in alcohol, to which a small portion of ether is added. The only other compound of ammonia that is sold in the perfumery trade is eau de luce, though properly it belongs to the druggist. When correctly made—which is rarely, very rarely the case—it retains the remarkable odor of oil of amber, which renders it characteristic.

EAU DE LUCE.

Tincture of benzoin ; or,	}	1 ounce.
“ balsam of Peru		
Oil of lavender		10 drops.
“ amber		5 drops.
Liquor ammonia		2 ounces.

If requisite, strain through cotton wool, but it must not be filtered, as it should have the appearance of a milk-white emulsion.

ACETIC ACID AND ITS USE IN PERFUMERY.—The pungency of the odor of vinegar naturally brought it into the earliest use in the art of perfumery.

The acetic acid, evolved by distilling acetate of copper (verdigris), is the true “aromatic” vinegar of the old alchemists.

The modern aromatic vinegar is the concentrated acetic acid aromatized with essential oils, camphor, &c., thus—

AROMATIC VINEGAR.

Concentrated acetic acid	8 ounces.
Oil of English lavender	2 drachms.
“ “ rosemary	1 drachm.
“ cloves	1 drachm.
“ camphor	1 ounce.

First dissolve the bruised camphor in the acetic acid, then add the perfuming oils; after remaining together for a few days, with occasional agitation, it is to be filtered, and is then ready for use.

Several forms for the preparation of this substance have been published, almost all of which, however, appear to complicate and mystify a process that is all simplicity.

The most popular article of this kind is—

HENRY'S VINEGAR.

Dried leaves of rosemary, rue, wormwood, sage, mint,	
and lavender flowers, each	½ ounce.
Bruised nutmeg, cloves, angelica root, and camphor,	
each	¼ ounce.
Alcohol (rectified)	4 ounces.
Concentrated acetic acid	16 ounces.

Macerate the materials for a day in the spirit; then add the acid, and digest for a week longer, at a temperature of about 14 c. or 15 c. Finally, press out the now aromatized acid, and filter it.

As this mixture must not go into the ordinary metallic tincture press, for the obvious reason of the chemical action that would ensue; it is best to drain as much of the liquor away as we can, by means of a common funnel, and then to save the residue from the interstices of the herbs, by tying them up in a linen cloth, and subjecting them to pressure by means of an ordinary lemon squeezer, or similar device.

VINAIGRE A LA ROSE.

Concentrated acetic acid	1 ounce.
Otto of roses	½ drachm.

Well shaken together.

It is obvious that vinegars differently perfumed may be made in a similar manner to the above, by using other essential oils in place of the otto of roses. All these concentrated vinegars are used in the same way as perfumed ammonia, that is, by pouring three or four drachms into an ornamental "smelling" bottle, previously filled with crystals of sulphate of potash, which forms "the sel de vinaigre" of the shops; or upon sponge into little silver boxes, called vinaigrettes, from their French origin. The use of these vinegars had their origin in the presumption of keeping those who carried them from the effects of infectious disease, doubtless springing out of the story of the "four thieves' vinegar," which is thus rendered in "Lewis's Dispensatory."

"It is said that during the plague at Marseilles, four persons, by the use of this preservative, attended unhurt multitudes of those that were affected; that under the color of these services, they robbed both the sick and the dead; and that being afterwards apprehended, one of them saved himself from the gallows by disclosing the composition of the prophylactick (a very likely story!), which was as follows:—

VINAIGRE DES QUATRE VOLEURS, OR FOUR THIEVES' VINEGAR.

Take fresh tops of common wormwood, Roman wormwood,	
rosemary, sage, mint, and rue, of each	¾ ounce.
Lavender flowers	1 ounce.
Garlic, calmus aromaticus, cinnamon, cloves, and nutmeg,	
each	1 drachm.
Camphor	¼ ounce.
Alcohol, or brandy	1 ounce.
Strong vinegar	4 pints.

Digest all the materials, except the camphor and spirit, in a closely covered vessel for a fortnight, at a summer heat; then express and filter the vinaigre produced, and add the camphor previously dissolved in the brandy or spirit."

A very similar and quite as effective a preparation may be made by dissolving the essential oils of the plants indicated in a mixture of alcohol and acetic acid. Such preparations, however, are more within the province of the druggist than perfumer. There are, however, several preparations of vinegar which are sold to some extent for mixing with the water for lavatory purposes and the bath, their vendors endeavoring to place them in competition with eau de Cologne, but with little avail. Among them may be enumerated—

HYGIENIC VINEGAR.

Brandy	1 pint.
Oil of cloves	1 drachm.
" lavender	1 drachm.
" marjoram	½ drachm.
Gum benzoin	1 ounce.

Macerate these together for a few hours, then add—

Brown vinegar	2 pints,
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and strain or filter, if requisite, to be bright.

TOILET VINEGAR (*à la Violette*).

Extract of cassie	½ pint.
" orris	½ pint.
Esprit de rose triple	½ pint.
White wine vinegar	2 pints.

TOILET VINEGAR (*à la Rose*).

Dried rose leaves	4 ounces.
Esprit de rose, triple	½ pint.
White wine vinegar	2 pints.

Macerate in a close vessel for a fortnight, then filter and bottle for sale.

VINAIGRE DE COLOGNE.

To Eau de Cologne	1 pint.
Add, strong acetic acid	½ ounce.

Filter if necessary.

Without unnecessarily repeating similar formulae, it will be obvious to

the reader that vinegar of any flower may be prepared in a similar way to those above noticed; thus, for vinaigre à la jasmîne, or, for vinaigre à la fleur d'orange, we have only to substitute the esprit de jasmîne or the esprit de fleur d'orange, in place of any other odor, to produce orange flower or jasmîne vinegars; however, these latter articles are not in demand, and our only reason for explaining how such preparations may be made, is in order to suggest the methods of procedure to any one desirous of making them leading articles in their trade.

We perhaps may observe, *en passant*, that where economy in the production of any of the toilet vinegars is a matter of consideration, they have only to be diluted with rose-water down to the profitable strength required.

Any of the perfumed vinegars that are required to produce opalescence, when mixed with water, must contain some gum-resin, like the hygienic vinegar, as above. Either myrrh, benzoin, storax, or tolu, answer equally well.—*Annals of Pharmacy*.

(To be continued.)

On the Action of Gallic and Tannic Acids on Iron and Alumina Mordants.
By PROF. CALVERT.—The author drew the following conclusions from the facts contained in his communication:—1st, that there can be no doubt that tannic acid is the matter in tanning substances which produces black with iron mordants; 2d, that the reason of gallic acid producing no black die is, that it reduces the peroxide of iron in the mordant, forming a colorless and soluble gallate of protoxide of iron; 3d, that gallic acid has the property of dissolving hydrate of alumina, and also of separating alumina mordants from the cloth on which they are fixed; 4th, that the reason of extracts of tanning matter losing their dyeing properties is, that the tannin is transformed into gallic acid; 5th, that gallic acid possesses the property of dissolving iron, and thus lays claim to the character of a true acid, whilst tannin, not having this action, appears to be in reality a neutral substance.—*Chem. Gaz.*, Nov. 15, 1854, from *Athenæum*.

Viviparous Fish.—Dr. Bennet Dowler has recently discovered in the vicinity of New Orleans a small osseous fish, which proves to be viviparous, having no less than twenty-two well-formed young in its body at the time of examination. Dr. D., however, yields the priority of description to Dr. Gibbons, who found them in California.—*Southern Med. and Surg. Journal*.

Depilatory. By M. BOUDET.—

Formula:—Sulphuret of Sodium or Cryst,

Hydro-Sulphate of Soda,	.	.	.	3 parts.
Quick Lime, (powdered)	.	.	.	10 "
Starch,	.	.	.	18 "

"Moistened with a little water this becomes so powerful a Depilatory that, if removed in one or two minutes with a wooden spatula, it leaves the

skin quite hairless. Independently of its use in removing abnormal villosity, it is of great service in preparing hairy parts for blisters or operations.

It is applicable to the most delicate or irregular surfaces of whatever extent, the hair re-appearing only after several days.—*Georgia Blister and Critic.*

Dupuytren's Pomade for Restoring the Hair.—

R. Pulv. Cantharides	1 drm.
Vin. Sp. Rect.	1 oz.

Macerate 12 days, shaking often and well : then filter.

Rub 10 parts of this Tr. with 60 parts of cold lard, adding Oil Bergamot, or any other perfume, q. s. Rub well into the head night and morning. "In 99 cases out of 100, this application, if continued, will restore the hair."—*Ibid.*

On the action of Citric, Tartaric, and Oxalic Acids on Cotton and Flax Fibres under the Influence of Dry Heat and Pressure of Steam. By PROFESSOR CALVERT.—The author observed that, when 2 to 4 parts of these acids are dissolved in 100 parts of water, and linen or cotton dipped into the solution obtained, and afterwards dried in the air, they, on exposure to certain temperatures, completely destroy the tenacity of the fibre. This action of organic acids is interesting when it is known that it takes place even at the low temperature of 180°, 212°, and 260° F. He also found that cotton and flax fibres, when prepared as above and then submitted to the influence of steam of 3 lbs. pressure, were destroyed.—*Athenæum.*

Quinic Ether.—A discovery which has lately been made in Italy, and which has excited much attention, is illustrative of the results of perseverance and industry.

In the month of June, 1852, a young man, M. Louis Manetti, a student of the University of Paris, happened to witness the death of a patient with congestive fever, who died apparently from the impossibility of introducing into the system, in a short time, a sufficient quantity of quinine. Manetti was struck with the idea that the principle of the bark might be effectually administered through the medium of pulmonary absorption. Encouraged by Professor Pignacca, Manetti began a series of investigations, the results of which are detailed in a letter from Prof. Pignacca to Dr. Stambio of Milan, a translation of which is found in the "*Annales de la Société Médicale de Grande.*"

Professor Pignacca has called the new agent for inhalation, *Quinic Ether*, probably for want of a better name, for it is not, properly speaking, an ether, and its positive chemical composition is not known. It is a liquid of a special inconstant odor, and is obtained by the distillation of quinate of

lime (*quinate de chaux*) combined with alcohol; and is analogous to the ethereal bodies in general, volatilizing like them.

Professor Pignacca states in his letter that he has administered this fluid by inhalation to eight patients; seven of them had tertian intermittent fever, the last neuralgia of the fifth pair. The neuralgia was of an intermittent type. The remedy acted admirably, both in the cases of fever and in the case of neuralgia.

The quantity of the agent given is about a scruple at a time, repeated three or four times a day. It is administered in the same manner as chloroform, and it produces sensations somewhat similar.—*N. O. Medical News and Hospital Gaz.*

Composition for Dyeing Cotton and Silk Goods of Rose and Purple Colors. By M. MALEGUE.—*Rose Color.* Four ounces of ammoniacal cochineal are dissolved in a quart of hot-water, and the solution boiled for ten minutes, 88 grains of salt of tin, 140 grains of crystals of tartar, 1 ounce of saturated aqueous solution of sulphurous acid, and 140 grains of solution of tin, hereafter described. The whole is boiled for about half an hour, and then allowed to cool in a glass or earthenware vessel, and afterwards decanted into another vessel. Two ounces of the carmine of safranum (extract of safflower), are then added, and well mixed with the solution. A sufficient quantity of the composition is then added to produce the required tint in the goods to be dyed.

Purple Color.—The same process is adopted as for rose color, with the exception that 350 grains of the solution of tin are employed in lieu of 140 grains, and 1½ ounces of safranum in place of 2 ounces. After having dyed a piece of cloth of six or seven yards length, it is advantageous to add about half an ounce of the extract of safflower.

The 4 ounces of ammoniacal cochineal in the above compositions may be replaced by 3 ounces of ammoniacal cochineal, and 3 ounces of raw cochineal. These two solutions are boiled together in the water for two or three hours, so as to evaporate about one-third part of the water. The other ingredients are then added as before.

The Solution of Tin is prepared by dissolving 5 parts of pure tin in a mixture of 5 parts of nitric acid, and 18 parts of hydrochloric acid, all by weight.

The Salt of Tin is prepared by dissolving pure tin filings or grains in hydrochloric acid, to which has been added one fifth part of its weight of nitric acid, and then evaporating the solution in a water bath, until the salt of tin is obtained in a solid state.

The Ammoniacal Cochineal is prepared by boiling finely-ground cochineal in twice its weight of solution of ammonia, for several hours. The mixture should be well stirred, and when it becomes thick it is placed upon a cloth, which is stretched on a piece of wicker-work, and placed in the stove to dry. The dried mass is then cut or broken into pieces.—*Annals of Pharmacy*, Nov. 2854.

Editorial Department.

UNIVERSAL EXHIBITION OF HUMAN INDUSTRY, TO BE HELD AT PARIS IN 1855. The exhibitions of industry at Paris have heretofore been confined to French products, but the great success of the London universal exhibition, induced the French government to announce, in 1852, that a similarly conducted exhibition would be held three years from that time in Paris, open to all nations. The British government, duly estimating the importance of these international assemblages, has voted \$250,000 to defray the expenses of the carriage of the British deposits to and from the port of Havre. The entire space in the apartments devoted to the articles for exhibition is 900,000 superficial feet, of which 150,000, or one sixth, has been allotted to Great Britain and her colonies. The Chemists and Pharmacutists of London have been moving in the matter since last summer, and have a regularly organized Committee. So far as we are aware, but little interest has been as yet manifested on this side of the ocean, yet much may have been quietly prepared. A commission consisting of Dr. Alfred L. Kennedy, Hon. Jas. Y. McLanahan, Dr. James Swaim, Hon. W. L. Helfenstine, C. L. Ward, Esq., Hon. Jeremiah S. Black, Jno. M. Grier, Esq., Wm. H. Welch, Esq., Pierce Butler, Esq., and Fred. Fraley, Esq., have been appointed by Governor Bigler, on behalf of the State of Pennsylvania.

For the information of our readers, we copy the following from the London Pharmaceutical Journal for September, 1854.

Brief summary of the conditions upon which the exhibition will be conducted.

“ 1st. The exhibition will open in Paris on the 1st of May, 1855.

2d. The French Commission will communicate only with exhibitors from foreign countries, through the Commission appointed by each country for that purpose.

3d. No article will be admitted from foreign countries, except with the sanction of such French Commission.

4th. Every article produced or obtained by human industry, whether of Raw Materials, Machinery, Manufactures or Fine Arts, is admissible, except

I. Living animals and plants.

II. Substances liable to become putrid from keeping.

III. Detonating and other dangerous substances.

IV. Articles of extravagant size.

5th. All goods must reach Paris between the 15th of January and the 15th of March, 1855; which period may, in a few exceptional cases, be extended to the 15th of April.

6th. The French Commission offers to convey all goods from the French ports or frontiers to the building in Paris, without charge.

7th. No charge will be made for rent.

8th. Exhibitors and their agents will be admitted free to the building, during the whole period of the exhibition.

9th. Plain counters and partitions will be provided without charges.

10th. The French Commission will find laborers for unpacking, transporting and arranging goods under the direction of exhibitors or their agents.

11th. The French Commission will provide shafting, steam or water presses for machines in motion.

12th. Exhibitors will be responsible for accidents, loss or damage, but the fullest precautions are promised against such events.

13th. The current trade price may be affixed to any goods, if the exhibitors desire it.

14th. Goods may be exhibited in bond, and no duty charged if re-exported.

15th. Exhibited goods, at present prohibited by the French tariff, may be admitted for consumption in France at an *ad valorem* duty of 20 per cent.

16th. Arrangements will be made to insure one year's protection to designs and inventions, if exhibited, without cost to the exhibitor.

17th. The goods will be examined by an international jury, and rewards given, the nature of which will be published."

We presume a commission has been or will soon be appointed by our national government, as the period for receiving the goods at Paris is rapidly approaching. The excellent tendency of these international exhibitions in the encouragement of commerce and the peaceful arts, and in the promotion of good feeling among distant nations, should induce a strong effort to render them as universal as possible. Our great distance from the point of exhibition, and the scattered state of our population, not to speak of the youthful condition of many of the arts and manufactures here, present obstacles to contributors not felt in European countries, and will probably render the contributions from the United States less interesting as objects of art than for utility.

CANTHARIDES AMONG THE LAWYERS, or *what is the normal per centage of hygroscopic water in Spanish flies?*—It was our unwilling lot to witness the proceedings in a recent case tried in the District Court in reference to a lot of cantharides, and a sketch of the facts may not be without use to some of our readers. A—, a powderer, being in want of cantharides, bought a lot of 100 lbs. from B—, a druggist, at \$2.70 per lb., without examining them. When A— received the flies he found them too damp to powder, and gave directions to have them dried on a steam heated surface at 100°

to 120° F., where they laid thirty-six hours, by which they lost sixteen pounds. A—— then informed B—— that his cantharides were damp and unmerchantable, and had to be dried, and as they lost 16 per cent., he claimed an allowance. B—— replied that they were good fresh cantharides, and were as he bought them, and that they must have been over heated or baked, and consequently refused to make a deduction in the price or to take them back, unless they were put in the condition they were, in at the time of the purchase. A—— said he would make them as they were when bought, by pouring on 16 lbs. of water, and would return them. B—— replied if returned in that condition he would send them to auction and have them sold on A——'s account. A—— carried out his declaration by watering the flies. B—— had them sold on A——'s account for 106 dollars below cost, which difference B—— claimed of A——, and being refused entered the suit against him.

The questions of fact to be decided were, 1st, What are merchantable cantharides? 2d. Were the cantharides sold by B—— merchantable? 3d. What is the amount of the "natural moisture" of commercial Spanish flies? 4th. Would the heat to which they were subjected injure the flies medicinally? 5th. Would flies with sixteen per cent. of moisture keep without undergoing decomposition?

The witnesses for the prosecution testified to the good quality of the flies at the time they were sold; a specimen of the same lot, kept in a bottle ever since, was exhibited. They believed the loss was occasioned by excessive heat or baking to the damage of the article and not to evaporation of water, and that in sending it to auction they viewed the flies in the light of damaged goods. They therefore claimed a verdict in their favor.

The witnesses for the defendant testified that the flies were quite damp when they were delivered; that they never before had had occasion to dry cantharides previous to powdering them; that the flies were put on the heated surface (the brick work above the boiler) on Saturday, just before the fires were put out, and remained till Monday morning; that when the boilers were in full operation the hand could be borne on the drying surface; that the flies had lost nothing but water, which water had been returned to them, and that they were, to all intents and purposes, as good when they were returned as when received, and he therefore claimed as being free of all obligations in regard to the flies, and asked a verdict accordingly.

In the course of the testimony much was said about the "natural moisture" of cantharides, and it was positively stated that flies with 16 per cent. of moisture would not keep but would putrify, and that that amount of water could only be present by accident or design. The principal witness for the defendant, an experienced druggist, averred that commercial flies never contained more than six per cent. of moisture, that the flies in question were not merchantable, and that the mode of drying them did not injure them.

After the usual display of legal manoeuvring, the case was submitted to the jury, who, after being out all night, could not agree, and were discharged. There were several legal technicalities in the case, not reported here, which tended to embarrass the jury.

Now what we wish to point out in reference to this affair is, the want of information manifested by the witnesses and lawyers in reference to the hygroscopic power of organic matter. We were prepared to give the following facts from experiment, but the trial was terminated without our being called to the stand, viz :

100 grains of cantharides that had been two years in a shop bottle, and were partially worm eaten, by exposure for six hours at a temperature of 100° to 120° F., lost 13 grains.

100 grains of the same cantharides, suspended in a large closed jar, containing a little water in the bottom, absorbed 10 grains without exhibiting any moisture on examination.

100 grains of powdered cantharides lost 11 grains when dried as above, and the same powder placed in the closed jar with moist air gained 16 grains.

From these results it is shown that *whole* cantharides may contain 23 per cent. of hygroscopic water, and the powder 27 per cent., without it being visible to the eye or perceptible to the touch, and that the flies in the suit at issue might have contained the amount of water alleged by simple exposure in damp air, without any fraud or ill intent, especially as they were fresh ; yet it is highly probable that flies saturated with hygroscopic moisture if kept in tight vessels in warm weather, especially if in powder, would mould and undergo change ; in fact we have seen powdered cantharides thus affected, the moisture in which must have been absorbed by accidental exposure after their pulverization.

On the other hand we believe the desiccating process had in no wise injured the flies medicinally, an opinion based on experiment, (see Amer. Jour. Pharm., Vol. xxiv. page 293) but it would have been wiser to have exposed them in a damp atmosphere until they regained the lost moisture by hygroscopic attraction, instead of pouring water on them, which would require a long time to distribute itself equally.

The moral of this transaction points to the necessity of druggists and powderers being acquainted with pharmacology in all its relations ; and to the ill results that arise from hasty action on doubtful premises. If the druggist had represented to the powderer the hygroscopic nature of cantharides, and requested him to satisfy himself by experiment, the latter must have been convinced that no fraud existed ; that he should have air-dried the flies, and not subjected them to artificial heat ; and that if any allowance was to be made for excessive moisture, it must relate only to what was above the normal per centage in fresh flies. The druggist being convinced that he was right, should not have taken back the flies, much less resorted to the

censurable course of sending them to auction, which, as the judge charged, was at his own risk, if not agreed to by the opposite party. We believe both parties were well intentioned in the beginning, but both were wrong, both lost their temper, and they should have shared the loss according to their deserts. We were not a little amused at the interest manifested by judge, lawyers, and jury in the subject of litigation, whose reputation for *causticity* appeared to have preceded their introduction to court.

Quinologie. Des Quinquinas et des questions qui, dans l'état présent de la science et du commerce, s'y rattachent avec le plus d'actualité; par M. A. Delondre, Pharmacien et Fabricant de Sulphate de Quinine à Gravelle (Havre); et par M. A. BOUCHARDAT, Professor d'hygiène à la Faculté de Médecine de Paris, &c. Avec 23 planches. Paris, Germer Baillière, 1854, quarto, pp. 48.

The work, of which the above is the title page, has just been published, and is unique in its character; differing from the work of Weddell in being more specially devoted to a description of the barks as they occur in commerce, and their relative alkaloidal value, than to their botanical relations and origin.

The first part of the book gives a general historical notice of the investigators of the subject, in which the authors endeavor to do justice to the celebrated Dr. Mutis, of Bogota, whose reputation as a medico-botanical discoverer has greatly suffered from the injustice of his cotemporaries and subsequent writers.

The second part is an episode of the visit of M. Delondre, to the western coast of South America. The name of this gentleman has long been known in connection with the manufacture of quinine, as a member of the old firm of Pelletier, Delondre & Levaillant. On the third of October, 1846, M. Delondre embarked at Bordeaux with apparatus, etc., on a private expedition to Bolivia, with the design of extracting the barks of all qualities, and thus avoid the transportation of a vast bulk of useless material. On his arrival at Valparaiso, he met M. Pinto, the Chief of the Bolivian monopolists, and failed in all his propositions to induce the latter to furnish him with regular supplies of bark, M. Pinto preferring the offers which he had received from a New York house. Soon after, the news of the death of his partner, M. Levaillant, added to his difficulties. In April, 1847, owing to the offers of Messrs. Vincueza and Santo Domingo of Cusco, who agreed to furnish him with 100 serons of bark per month, from the forests of Santa Ana in Southern Peru, he engaged to establish his laboratory at Valparaiso, but he was again disappointed by the failure of these gentlemen to deliver the bark. He then set out on the 1st of July, as a last resort, on a visit to Cusco, to see for himself. Arrived at the latter city, he found M. Vincueza absent in the forest, where he was soon after massacred by the Indians; whilst Santo Domingo, from the chagrin arising from ill success in his mining operations, soon after committed suicide. About this time he met with M. Weddell at Cusco, on his return from the Bolivian forests, and together they set out under the auspices of M. Romainville and an Indian guide, over the Cor-

dillera to the cinchona forests near Cocabambilla, and after inspecting the trees, returned to Cusco. M. Delondre, subsequently at Arequipa, made a new arrangement with M. Brillard, that also fell through, which induced him to re-embark with his apparatus at Valparaiso for Havre, to commence anew the manufacture of quinia, after his chapter of misfortunes.

The third part, which is more particularly interesting to Pharmacologists, is a description of the physical properties and economical chemistry of the principal commercial varieties of cinchona bark, with some hints relative to their botanical origin and commercial history. The chief value of the work consists in the accuracy and beauty with which the several barks have been represented by colored engravings to the number of twenty-three, including several inferior varieties and false barks. These are accompanied by descriptions of the barks and the alkaloidal value of each, based, in many instances, on the results of large operations. These essays are the more interesting, as they chiefly relate to the Columbian or New Grenada cinchonas, and exhibit a very favorable view of their medicinal value as indicated by the proportion of alkaloids. We have condensed them in tabular form, for the benefit of our readers :

Tabular view of the proportion of Alkaloids in the Cinchona Barks, according to the results of M. A. Delondre.

Commercial Varieties.	Locality.	Sulph. quinia yielded by 1000 grains of bark	Sulph. cinchon. yielded by 1000 grains of bark.
Flat Calisaya bark, without epidermis	Bolivia	30 to 32 grs.	6 to 8 grs.
Quilled Calisaya bark, with "	Bolivia	15 to 20 "	8 to 10 "
Flat Carabaya bark, without "	Southern Peru	15 to 18 "	4 to 5 "
Rolled Carabaya bark, with "	" "	8 to 10 "	5 to 6 "
Flat red Cusco bark, without "	" "	4 "	12 "
Rolled red Cusco bark, with "	" "	" "	6 to 8 "
Flat Huanaco bark	Central Peru	6 "	12 "
Pale yellow Huanuco bark, without "	" "	6 "	10 "
Rolled Huanuco bark, with "	" "	2 "	8 to 10 "
Rolled Jaen bark, with "	Northern Peru	10 "	4 "
Bright red bark	Equador	20 to 25 "	10 to 12 "
Pale red bark, rolled	"	15 to 18 "	5 to 6 "
Loxa bark (gris fin condaminea)	"	8 "	6 "
Loxa bark (gris fin negrilla)	"	2 "	10 "
Yellow bark of Guayaquil, without "	"	3 to 4 "	30 "
Rolled Orange yellow bark, or Calisaya of Bogota	New Grenada	18 "	4 to 5 "
	"	30 to 32 "	3 to 4 "
	"	18 "	4 to 3 "
Pitayo bark	"	20 to 25 "	10 to 12 "
Ligneous Carthagena bark	"	20 "	"
Orange yellow bark of Mutis, without epidermis	"	15 to 18 "	8 to 10 "
Red bark of Mutis, without epidermis	"	12 to 14 "	6 to 7 "
Yellow bark of Mutis	"	12 to 14 "	6 to 7 "
Rose colored bark	"	18 "	4 "
Maracaybo bark	"	3 to 4 "	10 "
Inferior yellow Cusco bark	(Peru)	.50 "	"
Inferior brown Cusco bark	"	.40 "	"
Inferior pale red bark	New Grenada	.18 "	.02 "
White bark	"	.06 "	.12 "

The fourth and last part of the work, which occupies but three pages, consists of practical suggestions in reference to the therapeutic value of cinchona, favorable to its employment. The authors advocate the mixing of the barks in making pharmaceutical preparations. So as to get a due relation of quinia and cinchonia. M. Delondre has been in the habit of preparing a crude quinine, which he calls *Quinium*, by lixiviating a mixture of 3 parts of powdered bark, and one part of lime in powder with alcohol 36° B., and distilling off the alcohol so as to get an extract like the calisaya extract of Mr. Ellis. This extract is suggested as the basis of various preparations, and by knowing the alkaloid value of the several barks, the proportion of them could be so varied as to keep the extract at about the strength of 33 per cent. of alkaloid.

The execution of the plates in the work deserves the highest commendation; so exact are the representations that the several barks may with readiness be recognized, and on these and the practical observations in the text, the merit of the work mainly rests. In a scientific point of view, its claims are but meagre; it does not enter into either the botany, microscopy or abstract chemistry of the cinchonas; yet as the authors lay no claim in that direction, they merit the thanks of pharmacologists for their beautiful and useful addition to the literature of Quinology.

Transactions of the American Medical Association. Instituted 1847. vol. vii., New York. Charles B. Norton, 1854, pp. 661, octavo.

We acknowledge the reception of this volume from the Committee of Publication. In glancing over the minutes of the meeting at St. Louis, we find them so exclusively occupied by strictly medical subjects, that any notice of them would be out of place in this Journal, except the following:

"On motion of Dr. C. B. Guthrie, of Memphis, it was

Resolved, That in the Secretary of the Treasury's recommendation to Congress, to abolish or materially modify the duty on such crude drugs, not producible in this country, as are used in the laboratories of the country, in the manufacture of chemicals, we recognize a wise provision for the future protection of the profession, and the community at large, from impure and sophisticated medicines."

"*Resolved*, That a copy of this resolution be signed by the proper officers of this Association, and be transmitted to the Secretary of the Treasury, and to the Committee of Ways and Means in Congress."

We hope the above resolution will prove influential. The present tariff, in many particulars, tends to discourage the home manufacture of chemicals.

"Dr. Edgar, of St. Louis, offered a resolution, recommending to apothecaries the adoption of labels of particular colors, in order to enable patients and others to distinguish poisonous from other compounds. This was laid on the table."

The course pursued by the Association was certainly the correct one, as any such recommendation would, at best, receive but partial attention, and would be worse than useless unless universally adopted by the apothecaries of each city. The German plan of putting the word poison (gift) on such substances is more feasible.

The President not being in attendance, Dr. Usher Parsons, one of the Vice Presidents, delivered the annual address.

The other principal subjects are the Report of the Committee on Medical Education; Report of the Committee on the Epidemics of Kentucky and Tennessee; on Erysipelas, by R. S. Holmes, M. D., of St. Louis; on the medicinal and toxicological properties of the Cryptogamic plants of the United States, by F. Peyre Porcher, M. D., of Charleston; Report on the Epidemics of Ohio, Indiana and Michigan for the years 1852 and '53; Report on the Epidemics of Louisiana, Mississippi, Arkansas and Texas, in the year 1853; Prize essay on a new method of treating ununited fractures, etc., by David Brainard, M. D., with lithograph plates; Report on the Norwalk disaster; and Dr. Linton's remarks on yellow fever.

Of these papers, the one most interesting to pharmacutists is the elaborate report of Dr. Porcher on the Cryptogamia of the United States, which extends to 120 pages octavo, and which has occupied the author several years. It is a supplement to the report on the Botany of South Carolina, presented and published in the second volume of the Transactions. In noticing the species, Dr. Porcher gives no botanical description, merely the generic and specific names and the common names, followed by the information he has been able to collect, in reference both to indigenous and foreign species. The genera *Agaricus* and *Boletus* are particularly full, and this section will prove serviceable in pointing out the noxious species of the mushroom tribe.

There are many items in this report that would interest our readers, but our space will not admit of their insertion.

The annual publication of reports, on the prevailing diseases of the several districts of the United States, must eventually prove of immense service to the medical profession, in enabling them to generalize more correctly in reference to the causes and treatment of epidemics, and to advocate, with the authority of knowledge, those public hygienic precautions which every community is bound to carry out; but which are too often left untaken until the severity of punishment that follows their neglect compels their effectual adoption.

The Transactions of the Association have heretofore been printed in Philadelphia. Some little feeling was manifested at the St. Louis meeting by the New York members, which resulted in the publication committee being chiefly selected from that city; hence, the present volume is published in New York; it is well printed on good paper, and is, as far as we are able to judge, creditable to the body from which it emanates.

Positive Medical Agents: being a treatise on the new alkaloid, resinoid, and concentrated preparations of indigenous and foreign plants. By authority of the American Chemical Institute. New York: B. Keith & Co., Proprietors and Publishers. Pp. 300.

We have rarely been more puzzled in getting at the true character of a book than has been the case with the one, the title page of which has been given above. Influenced by the title, one would infer that it contained some valuable additions to pharmacy, and to that important part which deals with the isolation and preparation of organic principles and extracts. We can imagine an Eclectic, after having purchased a copy, before glancing over its pages, saying to himself, "now has the Institute, influenced by a generous feeling in favor of suffering humanity, and by that liberal spirit that influences *scientific* bodies, made a full communication of the processes and formulæ of the preparations they claim to manufacture, by which we, who use them, may know what we are prescribing;" but alas! no such good fortune awaits this earnest seeker after knowledge; no such revelation of the profound secrets of New York Eclectic pharmacy was even intended to be made; the book, so far as regards the pharmaceutical aspect of the subject, is an absolute misnomer, and in this regard only is it a proper subject for our criticism.

The first 90 pages, under the caption of "general considerations," which are plausibly written, point to the importance of modifying therapeutics by substituting for crude drugs vegetable principles and other "concentrated preparations," and give an outline of the therapeutical classification or remedies.

The next 130 pages, under the head of "concentrated preparations," give a general account of the medical properties and doses of about thirty-five substances, used by the Eclectic practitioners. One cannot but observe how carefully the term Eclectic is repudiated in this book; indeed, whether used or not, we have not met with it, whilst the preparations noticed are almost exclusively those known as "Eclectic medicines," and which are described, with some exceptions, in the "American Eclectic Dispensatory."

The book being anonymous, the writer does not hesitate to frequently refer to the excellence of the preparations of the "American Chemical Institute," in the light of a disinterested observer, and this, in connection with the fact that it is published by or for that company, has led us irresistibly to the conclusion that the real object of the book is to create a demand for the medicines which, owing to the utter silence of the writer on their mode of preparation, can only be had of the "American Chemical Institute." The author says in the introductory letter:

"With each succeeding edition of this work, we hope not only to give additional descriptions of active concentrated remedies, but the *processes* for obtaining those concentrated articles which have been crowded out of this edition, for two reasons:—1st, we wish the profession to test the value of these medicines; and, 2d, for want of space in the limits assigned to the first edition.

We beg to have it distinctly understood that we make no pretensions above others of our profession, and should not at present have thought of publishing this work, had not the *demand for information* relative to the agents prepared at the American Chemical Institute, demanded some work of the kind."

And yet the very information which the writer admits is wanted is withheld, as the medical properties and uses of the plants and the medicines they yield are described in the Eclectic journals and medical treatises.

Regarding the value of the medical statements in this book we make no remark; these are beyond our province, yet it must be admitted that the accounts of the virtues and modes of using the several "preparations" is much like those appended to many patent medicines, very full on all points but their composition and preparation. For those, however, who desire information on the medical qualities of the preparations in question, the work before us may prove highly useful, and at the request of the proprietors we state that C. B. Norton, 71 Chamber street, N. Y., is now the publisher.

On the Construction, Organization, and General Arrangements of Hospitals for the Insane. By THOMAS S. KIRKBRIDE, M.D., Physician to the Pennsylvania Hospital for the Insane. Philadelphia: Lindsay & Blakiston, 1854. pp. 80, octavo.

The position of the author in the admirably conducted institution for the insane belonging to the Pennsylvania Hospital, gives his opinions and views in reference to the details necessary for the comfort and restoration of the insane in the construction and management of hospitals, great weight; and the volume now referred to cannot but prove useful in view of the increasing interest which is being manifested towards the unfortunate class who are the inmates of these institutions, by our State Governments.

Plantæ Heermannianæ. Descriptions of New Plants, collected in South California by DR. A. L. HEERMANN, Naturalist attached to the Survey of the Pacific Railroad route, under Lieut. R. S. Williamson, U.S.A. *With remarks on other Plants heretofore described and belonging to the same collection.* By E. DURAND and THEOD. C. HILGARD, M.D.

We acknowledge the receipt of the above from the authors.

CATALOGUE OF THE CLASS OF THE PHILADELPHIA COLLEGE OF
PHARMACY,

AT THE THIRTY-FOURTH SESSION, 1854-55.

The names of preceptors indicated in the second column, are those with whom the students now are; in several instances, they have been with others for longer or shorter terms. The third and fourth columns indicate the places from whence the students come.

Matriculants.	Preceptors.	Town or County.	State.
Armstrong, James A.		Philadelphia,	Pennsylvania.
Bakes, W. C.	Durand & Tourtelot,	"	"
Bancroft, Joseph W.	Gilbert, Wentz & Co.	"	"
Bannvart, Charles A.	Fred. Brown,	Paris,	France.
Bassett, William H.	Charles Ellis & Co.	Wilmington,	Delaware.
Beam, Isaac R.	Isaac R. Beam,	Philadelphia,	Pennsylvania.
Biddle, John	Wm. Biddle,	"	"
Brower, Noah B.	A. J. Moloney, M. D.	Norristown,	"
Bucher, Henry F.	C. R. Keeney,	Carlisle,	"
Cadbury, John W.	Charles Ellis & Co.	Philadelphia,	"
Campbell, Charles L.	William P. Troth & Co.	"	"
Campbell, John	John Murray,	Turella,	Scotland.
Campbell, Samuel	H. C. Blair.	Philadelphia,	Pennsylvania.
Carroll, Augustus D.	Charles Ellis & Co.	Wheeling,	Virginia.
Chenoweth, John T.	Charles S. Rand,	"	Kentucky.
Chapin, Dwight	G. W. Nebinger,	Philadelphia,	Pennsylvania.
Craige, Randolph	Thomas W. Craige, M. D.	"	"
Cummings, Wm. T.	Wm. F. Patterson, M. D.	"	"
Curry, John L.	Russell & Schott,	"	"
Dickson, John M.	W. Gayley,	"	"
Dilke, Theodore	H. M. Zollkoffer,	"	"
Douglass, George W.	Thomas P. James,		
Dunton, Jacob	Charles Ellis & Co.	Philadelphia,	Pennsylvania.
Epting, Charles W.	Frederick Klett & Co.	Pottsville,	"
Evans, Jr. William	Wm. Evans,	Philadelphia,	"
Evans, William H.	Henry C. Blair,	"	"
Fairthorne, Robert	B. Ritter,	St. Albans Heris,	England.
Farley, John W.	Dr. J. Wilson Farley,	Philadelphia	Pennsylvania.
Fearing, Henry Martin	Samuel C. Sheppard,	Elizabeth City	N. Carolina.
Fisher, Paul	Wm. King,	"	Prussia.
Fleming, W. S.	H. C. Blair,	Carlisle,	Pennsylvania.
Frazer, Christian S.	Russell & Schott,	Harrisburg,	"
Gerhart, Herman	John Bley,	Philadelphia,	"
Graham, Isaiah H.	Frederick Brown,	Carlisle,	"
Gray, Albert	Wm. Taylor,	Columbia,	"
Griffith, J. Clarkson	Benjamin J. Crew,	Winchester,	Virginia.
Hallam, Thomas			New Jersey.
Hancock, Charles W.	Charles F. Shrom,	Belmont,	Pennsylvania.
Harte, James Henry	Thomas Gegan,		Ireland.
Higbee, Hugh H.	Charles Shivers,	Moorestown,	New Jersey.
Himes, Thomas J.	T. J. Himes,	Shippensburg,	Pennsylvania.
Hitt, A. J.		Millersburg,	Kentucky.
Hooper, John H.	Gilbert, Wentz & Co.	Cambridge,	Maryland.
Hoffecker, James P.	Tristram Needles,	Smyrna,	Delaware.
Hazelton, William	French & Richards,		New Jersey.
Jackson, James M.	William P. Troth & Co.	Philadelphia,	Pennsylvania

Kelly, Edward B.	Johnson, Holloway & Cowden	Lebanon Co.	Pennsylvania.
Kearney, Wm. H. Z.	Alfred Wynkoop,	Philadelphia,	"
Kendall, John H.	A. M. Snyder,	Reading,	"
King, Wm. H.	D. & E. Parrish,	Liberty Co.	Georgia.
Kollock, M. Henry	Frederick Brown,	Philadelphia,	Pennsylvania.
Leuchsening, Hermann	Bullock & Crenshaw,	Havana,	Cuba.
Lyne, Thomas V.	Charles Ellis & Co.	Portsmouth,	Virginia.
Lawall, Edmund D.	James N. Marks,	Allentown,	Pennsylvania.
Leib, H. Clinton	Bullock & Crenshaw,	Philadelphia,	"
Lukens, Edward	Frederick Klett & Co.	Downingtown,	"
Lizé, Alexander	Alfred Tatem,	Rouen,	France.
Leamy, James C.	Thomas Wiegand,	San Francisco,	California.
Massenbury, Thomas L.	Bullock & Crenshaw,	Hampton,	Virginia.
Meyers, Edward S.	Edward B. Garrigues,	Columbia,	Pennsylvania.
McBride, James	E. & C. Yarnall & Co.	Montgomery,	"
McConaughy, A. D.	Thomas Jones,	Philadelphia,	"
McFee, George W.	John Horn,	"	"
Miles, John Q.	Wm. J. Carter,	Baltimore,	Maryland.
Mittnacht, Henry	Caleb H. Needles,	Philadelphia,	Pennsylvania.
Morgan, David U.	George H. Ashton,	Salem,	New Jersey.
Merritt, Alfred C.	Browning & Bro.	Philadelphia,	Pennsylvania.
Neal, Leander	Samuel Simes,	"	"
Noble, Thomas	James Bond,	San Francisco,	California.
Page, S. Davis		Mullica Hill,	New Jersey.
Pancoast, Dillwyn P.	Joseph C. Turnpenny,	Portsmouth,	Virginia.
Pedrick, Charles W.	Joseph A. McMakin,	Philadelphia,	Pennsylvania.
Penrose, Thomas N.	J. R. Angney, M. D.	"	"
Perot, E. L.	Charles Ellis & Co.	Paris,	France.
Perrot, E. Raphael	Wm. M. Reilly,	New Haven,	Connecticut.
Pratt, Wm. H.	Wm. Hodgson, Jr.		
Reichart, J. E.	George C. Bower,	Philadelphia,	Pennsylvania.
Rosengarten, Harry B.	Rosengarten & Sons,	"	"
Robbins, Alonzo	John W. Simes & Son,	Madison,	Indiana.
Stevens, J. Blackford	C. Ellis & Co.	Philadelphia,	Pennsylvania.
Scattergood, George J.	C. Ellis & Co.	"	"
Shick, Andrew J.	Bullock & Crenshaw,	"	"
Siddall, Frank H.	John C. Baker & Co.	"	"
Stroel, Wm. H.	George H. Ashton	"	"
Steever, Mark R.	William P. Troth & Co.	"	"
Stockdell, Hugh		Petersburg,	Virginia.
Stokes, Joseph C.	Higbee & Stokes,	Moorestown,	New Jersey.
Sickels, John W.	Thomas S. Kirkbride, M. D.	Utica,	New York.
Taylor, Joseph A.	Ambrose Smith,	Philadelphia,	Pennsylvania.
Taylor, Horace B.	D. & E. Parrish,	"	"
Thorne, William H.	Johnson, Holloway & Cowden	Palmyra,	"
Thompson, William	J. Weber,	Liverpool	England.
Verner, Chittick	Dr. Jas. Cornick, U. S. N.	"	Ireland.
Weaver, J. Thornton	Henry A. Bower,	Philadelphia,	Pennsylvania.
Weaver, Thomas	D. & E. Parrish,	"	"
Wetherill, J. Bloomfield	Thomas P. James,	"	"
Wenzell, Wm. T.	Dr. W. P. Vasey,	St. Louis,	Missouri.
Wilson, Adam H.	John Moffet,	Philadelphia,	Pennsylvania.
Wilson, Henry M.	Wm. T. Taylor, M. D.	Holmesburg,	"
Young, Joseph E.	William Procter, Jr.	Philadelphia,	"
Zieber, Jacob B.	Samuel Chamberlain,	Reading,	"

THE
AMERICAN JOURNAL OF PHARMACY.

MARCH, 1855.

INCOMPATIBILITY OF SULPHATE OF QUINIA WITH THE
ACETATES.

BY JOHN M. MAISCH.

In pharmaceutical works we generally find among the incompatibles with sulphate of quinine, the alkalies, their carbonates, the alkaline earths, tannin, &c., which act by either separating that alkaloid from its acid, or, recombining therewith, forming an insoluble salt; nothing is said about acetic salts.

The acetates of the alkalies are valuable diaphoretics and diuretics, and therefore are much esteemed for their activity in febrile diseases, particularly the acetate of ammonia, in the form of spiritus Mindereri is extensively used. It was a short time ago that a friend of mine received a prescription calling for a solution of 12 grs. of sulphate of quinine in 1 oz. of water with 1 oz. of liq. ammon. acet., which unsuspectingly was put up, but subsequently returned by the physician, the solution having deposited many crystals in the form of prisms. It is obvious that ammonia, which is the stronger base, must unite with the strongest acid, forming sulphate of ammonia and acetate of quinine, the latter of which, being nearly insoluble in water, is precipitated.

After repeating the same, I determined to make some other experiments, with a view to ascertain the peculiarities of this acetate of quinine, which has heretofore been little noticed, it seems, and the results which I have obtained may probably be of some use for further investigation.

When 6 grs. sulphate of quinine, by the aid of sulphuric acid, are dissolved in $\frac{1}{2}$ oz. water, and this solution is mixed with liquid acetate of potassa (10 grs. in 1 dr. water,) the precipitate thrown down is curdy, consisting of minute crystals, and so voluminous that it does not drop out of the glass if it be turned upside down.

The solution of acetate of ammonia contains about 6 per cent.

of that salt, making about 14 grs. in $\frac{1}{2}$ oz. of the solution. The equivalent weight of acetate of potassa is nearly one half as large again as that of the ammoniacal salt; 14 grs. of the latter would suffice to convert about 37 grs. of disulphate of quinine into the acetate, whilst 10 grs. of the former could not decompose over 19 grs. of the quinine salt. Still $\frac{1}{2}$ oz of spir. Mind. decomposes 6 grs. of sulphate of quinine into a deposit of rapidly forming prismatic crystals, which are not near so voluminous as those formed by the potassa salt.

Again, if dilute acetic acid be neutralized by magnesia, $\frac{1}{2}$ oz. of that solution precipitates the above solution of quinine partly in needles, combined to stars of a silky appearance, which also appear on the mixture of a solution of acetate of zinc.

The crystals of acetate of quinine form more beautifully, though also more slowly, in the solution of sulphate of quinine in diluted muriatic acid. I have obtained them in beautiful groups of feathery, tree, or fan-like appearance. I have satisfied myself that these precipitates consist of pure acetate of quinine; those formed by the potassa and zinc salt were charred in a porcelain vessel over the spirit lamp, destroying the quinine salt; the residue did not effervesce with acids, neither water nor acid took up anything by boiling; therefore nothing inorganic was contained in the salt.

Sometimes the crystals are at first transparent, but become opaque after being left under the liquid for a while; they do not dissolve, or only very little in cold water, and in the cold solutions of acetate of ammonia, potassa and soda, but they all retain a larger portion in solution after they have been boiled with the acetate of quinine. Chloride of ammonium seems to dissolve a larger portion of it, for when a solution of sulphate of quinine is mixed with a strong solution of sal ammoniac, the precipitate occasioned by acetate of potassa is less in quantity, at all events it does not stiffen the mixture, as is the case if that addition is not made.

To repeat these experiments, it is necessary not to add any more of the acid than is exactly required for dissolving the sulphate of quinine; an excess of acid decomposes the newly formed acetate of quinine, a part of which, or all, goes in solution again as sulphate or muriate of quinine.

The same experiments may be made with muriate of quinine, on dissolving it in dilute muriatic acid; in this case the crystals generally appear slowly.

For medical use none of the salts of quinine can be used in mixtures together with any of the acetates. But should such a combination be desirable, it may be done by dissolving the *pure alkaloid* or the *acetate of quinine* in acetic acid, which then will be compatible with any of the soluble acetates, as well as with the chlorides and sulphates of the alkalies and alkaline earths.

Although the mixture of solutions of sulphate of cinchonine and the acetates of the alkalies does not produce any precipitate, still it would be injudicious perhaps to prescribe such a one, as they also decompose each other, forming a soluble acetate of cinchonine and sulphate of the alkali, the quantity of which will be increased by the acid necessary for obtaining the solution of the sulphate of cinchonine. Also in this case it would be advisable to produce first a solution of acetate of cinchonine.

Philadelphia, January 1855.

ON THE CULTURE AND MANUFACTURE OF CASTOR OIL IN ILLINOIS AND ST. LOUIS.

BY WILLIAM PROCTER JR.

About the middle of last year, the Editor of this Journal, desirous of learning something more definite in regard to the castor oil manufacture and trade than was to be obtained from mercantile sources, addressed a letter to Mr. Guilford T. Chamberlain, Pharmaceutist of St. Louis, requesting the fullest information his favorable position would enable him to procure, both as regarded the culture of the ricinus in Illinois, and the manufacture of the oil there and in St. Louis, which has been responded to in a letter recently received, from which the following facts relating to the subject as regards St. Louis and Illinois have been derived.

Southern Illinois is the source from whence all the beans are brought that are sold or manufactured in St. Louis. The ground is prepared as for other crops, and when there is no longer any danger from the Spring frosts, the seeds are planted in hills and rows, much in the manner of planting Indian corn, with the ex-

ception that there is but one seed put into each hill, and that at every fourth row a space is left sufficiently wide to admit of the passage of a team for the purpose of gathering the crop. Unlike the cereal grains the ricinus bears at the same time flowers and fruit, and the severity of our climate, which renders it in this latitude an annual plant, destroys its vitality whilst yet decked with bloom. The ripening commences in August, and the crop is gathered at intervals from this date till the plants are destroyed by the frost.

The yield of course varies with the quality of the soil, and the care of the culture. Twenty-five bushels from an acre of ground is considered a very large crop, and is but seldom obtained. From sixteen to twenty bushels per acre is a very fair yield in a season not marked by drought or other unfavorable feature.

In regard to the manufacture of castor oil, (says Mr. Chamberlain,) I cannot do better than to give you the following statement which was kindly furnished by the proprietor of one of the oil mills in St. Louis. "The primitive mode of making castor oil was by putting the [bruised] beans in a bag and placing the same in a kettle of water, and as the beans were boiled, the oil came to the surface and was skimmed off. Subsequently, there was adopted the screw and lever presses, and other devices for pressing the beans, and many mills sprang up throughout the southern portion of Illinois, some of which remain in use until this time. The beans are first kiln-dried, and then pressed without grinding, the oil thus obtained being called "cold pressed," to distinguish it from the boiled oil, (that obtained by boiling the beans in water).

About nine years ago, Mr. Henry T. Blow commenced using the ordinary hydraulic press in its manufacture, increasing the yield from the raw material, and working the beans with greater rapidity and economy. About two years since, Mr. Latourette introduced a new press of his own invention, which was patented October 28th, 1851, which has brought the business to a greater state of perfection by increasing the product of oil from the bean $37\frac{1}{2}$ per cent. over the ordinary hydraulic press, and securing other advantages, such as saving of labor and fuel. One of these presses will work 150,000 bushels of beans per annum,

producing as much as 400,000 gallons of oil. It is said that one of these presses worked on castor oil, in connection with others on linseed oil, furnishes sufficient combustible refuse from the castor bean to supply fuel for the works; and in this way the fuel from the bean is of sufficient value to pay all the expenses of manufacturing the oil. The amount saved in Latourette's establishment, by burning the above refuse, when in full operation, is about fifty dollars per week.

After the oil is pressed from the beans it is clarified by boiling in large kettles with a small portion of water, and when perfectly clear is allowed to cool, and is then drawn off into barrels ready for market. During the months of July, August, and September 1854, there were manufactured thirty-two thousand gallons of castor oil at this establishment alone."

Mr. Chamberlain obtained the following statistical view of the castor oil production from another establishment which shows that the manufacture of the oil, which in 1850 was largely carried on in Illinois, is now mostly effected in the city of St Louis.

Year.	Crop in bushels.	Factories in Illinois.	Factories in St Louis.	Barrels of oil made.	Equivalent in gallons.
1850	250,000	18	2	9,900	350,000
1851	160,000	7	2	7,000	255,000
1852	90,000	5	2	5,500	192,500
1853	65,000	3	3	4,200	147,000

The estimated crop of beans for 1854 is but 10,000 bushels, being almost a total failure, arising from the excessive drouth that prevailed during the past summer over that part of the country. The number of mills in operation in 1854 was but five, and they only employed part of the time.

The above statements exhibit a gradual decline in the amount of oil produced which arises partially from the deceased crops, and partly, probably, from a limitation in the demand. The price of oil in 1852 and 3 was as low as 60 to 80 cents per gallon, and is at present up to \$1.25, if not higher, by the barrel, which, with the short crop of the past year, will probably raise yet higher, so as to prove an inducement to the farmers to again turn their attention to raising the beans. We saw it stated in the newspapers that castor oil had been used on one of the west-

ern rail roads for oiling the axles of cars, and probably also on the locomotives. Since the rise in the price of whale oil, the attention of machinists has been turned to various substitutes, and it is probable that the non-drying quality of castor oil, when pure, will render it very valuable for lubricating purposes, if it can be produced at a sufficiently low price.

The chemistry of castor oil is exceedingly interesting since the researches of M. Bouis (*Am. Jour. Pharm.* vol. xxvi, 414,) and others, proving it to be capable of yielding a fourth of its weight of sebacio acid by distillation with potash, which it has been suggested may be applied to illuminating purposes like spermaceti and stearic acid. The variableness of castor oil in quality, as regards color, odor, and taste, may easily be accounted for by reference to the preceding statements of the mode of manufacture. The object of kiln-drying the beans, is to free them from moisture, and by thus toughening the albuminous tissues, to render them less liable to pass out in an emulsive form, with the oil. It may be, also, that this heating, when it immediately precedes the expression, greatly facilitates the flow of the oil by increasing its liquidity.

Pure castor oil, according to Lowig, consists, proximately, of ricinin and palmitin, two neutral fatty substances. The last is bland, and is identical with one of the fats in palm oil; whilst the ricinin is less bland, and by saponification, or by excessive heat, yields ricinic acid, an exceedingly acrid substance, which is the chief cause of the increased activity of old rancid castor oil. Now it is not improbable, that occasionally the excessive application of heat may partially act on this ingredient of the oil, either in the preliminary process of drying, or in the subsequent steps of boiling the oil with a little water till the moisture is driven off. Another cause of inferiority in oil, may be the occasional use of old beans. There is much yet to be learned in reference to the proximate chemistry of castor oil beans. Mr. Henry A. Bower, (*Amer. Jour. Pharm.*, vol. xxvi, page 207) has shown that the albumen of the seeds are analogous to, if not identical with, the emulsin of almonds;—also that the peculiar nauseous odor which is developed when the seeds are triturated with water, is probably due to a substance that does not pre-exist

in the seeds, but like oil of bitter almonds is generated by the reaction of the emulsin on some principle not yet isolated. The question at once suggests itself, whether the well known activity of the residue after the expression of the oil, which is such that the amount of it in two or three seeds produces cathartic effects equivalent to an ounce of castor oil, is due to this hypothetical substance, developed by contact of moisture? or whether it could be traced to a pre-existent, well defined principle, of extreme acrimony, capable, in the diluted state in which it must exist in the residue, of producing the effect indicated? And finally, if such a principle exists, whether it is soluble to any extent in the expressed oil, and contributes to its cathartic power? The statement of Dr. Wood, (U. S. Disp.,) that the ebullition of the oil with water removes an acrimony at first possesses, seems to suggest the latter view as correct. These inquiries are worthy of the attention of pharmaceutical chemists.

ON THE TINCTURE OF CHLORIDE OF IRON.

By A. P. SHARP, of Baltimore.

I have frequently been at a loss to know how to make the above preparation of the required strength of the U. S. Pharmacopœia, from the fact of the impossibility (at least as far as my experience has gone) of obtaining the acid of the proper specific gravity, 1160, which is necessary to dissolve all the iron.

I have tried different plans, and have gone to considerable expense to get the acid of 1160, and even after obtaining it of that specific gravity, have found it would not answer the purpose, and upon investigating the cause of it, have always found that the acid was brought to the above specific gravity by the adulteration of sulphuric acid, either intentionally or accidentally. I propose a simple plan whereby every pharmacist may always obtain the tincture of the proper strength and with very little trouble, which plan I prefer to any other I have tried. I comply with the directions of the U. S. Pharmacopœia, using the pure muriatic acid, until I am satisfied no more iron will be taken up. I then fit a cork and bent glass tube to an ordinary Florence flask, partly filled with commercial muriatic acid, and after properly

adjusting the tube in the solution (acid and iron) contained in a porcelain dish, apply the heat of a spirit lamp to the flask, and in a few minutes, the muriatic acid gas* passing off into the solution, dissolves the remaining iron, and gives a beautiful clear solution; which, even upon the addition of the alcohol, renders the filtering of it entirely unnecessary, unless the iron should contain some insoluble impurity.

Tincture of chloride of iron prepared as above, has a specific gravity of 1010, and yields thirty five grains of per-oxide of iron to the fluid ounce.

I find, upon inquiry among some of our best pharmacutists, that they all have experienced the same difficulty in not being able to dissolve the iron; and I therefore, have submitted this simple plan, hoping it may be deemed worthy of an insertion in your useful and interesting journal.

January, 1855.

SYRUPUS FERRI PHOSPHATIS.

By T. S. WINGAND.

The experience of many physicians having accorded to the phosphates decided remedial powers, it was presumed that a formula, which would exhibit them in a scientific manner, would be acceptable to most of the readers of this journal. The following formula has been used quite freely by the writer, and with such satisfactory results (pharmaceutically only, of course, I can speak of) that I offer it with confidence to the notice of our profession.

B. Ferri Sulph. Cryst.	grs. 500
Sodæ Phos. do.	grs. 1800
Acidi Chlorohydrici	ʒiv.
Sacchari	ʒvii.
Aquæ	q. s.

Dissolve the phosphate of soda in two pints of water, filter if necessary; then make a solution of the ferruginous salt, add the phosphate of soda to the iron solution as long as it occasions a precipitate, which should be washed with recently boiled cold

*Muriatic acid losing its gas by heat until the specific gravity is reduced to about 1095.

water, and when free from saline contamination should be dissolved by means of the acid and filtered. To the solution add the sugar in coarse powder, and make up the measure by means of distilled water to twelve and a half fluid ounces.

Syr. Ferri et Calcis Phosphatis.

This preparation is made by manipulating exactly as in the foregoing case, and adding to the solution of the phosphate of iron all of the magma of phosphate of lime resulting from the decomposition of the sixty-five grains of chloride of calcium by means of seven drachms of crystallized phosphate of soda, after it has been well washed. There is no more acid necessary in this case than the former, and the preparation may be used in the same doses.

ON THE VOLATILE OIL OF ERIGERON PHILADELPHICUM.

By THE EDITOR.

In the twenty-sixth volume of this Journal the Editor called attention to the volatile oil of *Erigeron Canadense*, a new therapeutic agent brought into use by the Eclectic practitioners, and which occurs in commerce labelled "Oil of *Erigeron*," the specific name of the plant not being named. On a recent visit to the establishment of Mr. Frederick L. John, of this city, he called our attention to a small vial of the oil of *Erigeron Philadelphicum*, and expressed his doubts as to the genuineness of the commercial oil of *Erigeron*, owing to its difference in odor and color from his specimen. Mr. John, not being aware which plant yielded the oil, took occasion last summer to have collected a quantity of the species mostly employed by physicians here, the *E. Philadelphicum*; and in January last, he submitted the dried herb to distillation with water, and was not a little surprised at its small yield. He charged the still with 17 lbs. of the plant, and a due proportion of water, and on its exhaustion returned the distilled water to two fresh additions, thus treating forty-five pounds of the herb, from which with his utmost care he was able to collect but half a drachm of volatile oil. This he very politely requested us to accept, which we did, on condition of giving a notice of it here. This oil has a greenish yellow color, powerful, penetrating, aro-

matic and somewhat herbaceous odor, suggesting that of the bruised plant, and a bitterish, pungent, disagreeable taste; its consistence is much more viscid than the oil of *E. Canadense*, and its taste much more decided. Its specific gravity, ascertained by carefully weighing a buck-shot whilst suspended in the oil, with a delicate balance, is .946, whilst that of the *E. Canadense* is .845 to .850. It is evidently more oxygenized than the last named, as potassium rapidly decomposes it, and it is probably much more soluble in water.

It is evidently a different oil from the commercial oil of *Eriogon*. The fact of *E. Philadelphicum* not being productive in oil has been noticed by others. In the *Eclectic Dispensatory* (page 452) it is stated that this plant "yields on distillation a pale yellow acid styptic volatile oil, resembling that of *E. Canadense*." This is either a mistake, or the difference in the results must have arisen from distilling the oil there described from the plants freshly gathered, which may occasion the difference, especially as the flowers in which the oil chiefly reside are, like most of the compositæ, favorable to the dissipation of the oil.

GLEANINGS—CHEMICAL, PHARMACEUTICAL AND MEDICAL.

Manufacture of Alcohol from Wood.—M. J. Nickles, in his correspondence in *Silliman's Journal* for January, remarks that the increased price of wine, occasioned by the grape disease, and the partial prohibition of the use of cereal grains, has directed the attention of manufacturers of alcohol to other sources, and beet juice, Indian corn, couch grass, and asphodel have been employed experimentally. Recently, M. Arnoult has sought the sugar derived from wood by the action of sulphuric acid, as a source of alcohol. He has succeeded in obtaining 70 to 80 per cent. of sugar from poplar wood. The wood is reduced to coarse saw-dust, dried at 212° F., and after cooling it is moistened with sulphuric acid by gradual additions, so that the mass shall not become heated, until 110 parts have been added for each 100 parts of dried wood. After reposing twelve hours, the apparently dry mass is triturated until it becomes quite liquid. This is diluted with water, boiled, the acid saturated with chalk, and the liquor

filtered from the sulphate of lime is fermented and distilled in the usual manner. The author hopes to be able to diminish the proportion of acid, and thus render the process more economical.

French enterprise in Algeria.—In the correspondence above quoted, there is an interesting account of the products raised in Algeria under French encouragement. In 1853, nearly 80,000 lbs. of silk cocoons were produced in one department, and the plantations of the mulberry are extending. Madder is being raised profitably. The cochineal culture appears to be no longer doubtful, as 29 cactus plantations are in operation. The best varieties of cotton are being cultivated with great success, the cotton of Algiers having received 11 prizes at the London Exhibition. The olive tree in Algeria attains the height of a forest tree, and in the district of Kabylia it is very abundant. Since 1852, the oil trade has greatly increased, owing to the pains that have been taken to introduce the art of grafting among the natives, and in the establishment of well managed oil factories among the mountains. The product of oil exported in 1853, amounted to about six millions of pounds. The course pursued by the French government in fostering the productions of this colony, must eventually render it of great value, however costly at present.

Effects of pressure on the fusing point.—Mr. Hopkins, (Proc. Brit. Assoc.) has been making some experiments on the fusing points of several substances under great pressure, which has afforded with four of them, the following results exhibited in tabular form in Silliman's Journal.

Substances.	Pressure in lbs. to square inch.			Temperature (Fahr.) of fusion.		
Spermaceti,	0	7790	11,880	124°	140°	176.5
Wax,	0	7790	11,880	148.5	166.5	176.5
Sulphur,	0	7790	11,880	225	275.5	285
Stearine,	0	7790	11,880	158	155	165

As it was impossible to use glass for the containing vessel so as to witness the process, a very ingenious contrivance was resorted to determine when fusion occurred. A ball of iron was placed on the top of the substance under pressure, which deflected a small magnetic needle above it outside, but as soon as the substance melted, the ball fell, and the needle returned to its proper position.

Sulphate of Quinidine in Intermittent Fever.—Dr. J. S. Dorsey Cullen, one of the Assistant Physicians at the Philadelphia Hospital, reports in Hay's Journal for January, 180 cases of intermittents treated with sulphate of quinidia. The patients were mostly Irish and German laborers; in nearly every case a purgative was administered before commencing with the quinidine; the dose was generally three grains every hour for five hours preceding the period for the recurrence of the chill. Of the 180 cases, 111 were of the quotidian type, 35 of the tertian, and 31 tertian and quotidian. In 129 cases, the chill was averted by 15 grains of the salt, without a return of it. After the arrest of the chill, the patients, in every instance, took an infusion made of serpentaria, gentian and cinchona, with citrate of iron. Dr. Cullen is so well convinced of the efficacy of sulphate of quinidia, that he employs it instead of the quinia salt for the uses stated, as its lower price makes it an object in the economy of the hospital.

New Hæmostatic.—M. Hannon, of Belgium, believes the following composition to possess powerful hæmostatic properties superior to any other known, whether applied locally or taken internally, viz:—Take of benzoic acid 1 part, alum 3 parts, ergotine 3 parts, water 20 parts, boil them together for thirty minutes in a porcelain capsule, constantly stirring the mass and replacing the evaporated moisture. Finally, it is concentrated to the consistence of an extract, with constant stirring to prevent the separation of the benzoic acid by crystallization, and when finished, has a brown color and strong astringent taste.

It is applied externally in the form of a plaster over the seat of the hemorrhage. For its internal use, as in hæmoptysis, it is sufficient to make up the ingredients mixed together directly into pills, thus: powdered benzoic acid 15 grs., powdered alum and ergotine, of each 45 grs., mix and form into 16 pills, one of which is to be given every two hours.—*Hays' Journal*.

Thein and Caffein.—Prof. Albers having made a series of experiments on frogs and rabbits with the citrates of caffein and thein, has arrived at the following results in reference to their physiological action.

1st. Both are capable of producing tetanic rigidity in frogs,

as completely as does strychnia, one grain introduced below the skin being sufficient.

2d. They affect the heart equally with the external parts.

3d. They each cause contraction of the heart, which distinguishes their action from that of other narcotic alkaloids, and they act more violently on cold than on warm blooded animals. Caffein produces the same effects when introduced directly into the circulation as when taken into the stomach. The effects of caffein on the human system is that of a powerful sedative and anodyne, especially applicable to neuralgic headache. The dose, in such cases, is 2 grains.—*Hays' Journal*.

Opium fumes for Coryza.—Dr. Lombard states that the severe pain in the nose and frontal sinuses which often attend coryza, (or cold in the head,) is relieved with great success by the fumes of partially burned opium. The patient each time places a grain and a half or two grains of powdered opium on a piece of sheet iron held over a lamp, and inhales the fumes through the nose till relieved.—*Brit. & For. Rev.*

Manner of odorizing Wines in Greece.—To communicate a most exquisite aromatic taste and odor to wine, in Greece, wine makers are in the habit of putting the flowers of the grape-vine in the must before its final fermentation.

The flowers are gathered at night after a hot day when they evolve the greatest odor. The stalks are struck with a stick, and the flowers received on a plate as they fall, thrown into baskets, and then spread on linen in thin layers to dry in the shade. When dry, they are put into glass or earthen jars, pressed even, hermetically sealed and kept in a cool place till they are required for use.

In using them about 100 pints of clear new wine is put into a small cask, and a pound of the flowers contained in long, slim, thin muslin sacks are suspended in the casks, which are then carefully bunged, furnished with a recurved tube passing the bung, and placed in the cellar to ferment, after which the flowers are withdrawn and the wine racked off into another cask, which should be entirely filled. After again racking, the operation is terminated, and the wine thus prepared is used as a kind of *boquet* essence to give to other wines the odor it possesses.

The quantity to be used depends on the taste of the operators—*Jour. de Pharm., Dec. 1854.*

Process for revivifying Animal Charcoal, by M. Pelouze.—This process is founded on the property that caustic and carbonated alkalis possess of dissolving the coloring matters contained in animal carbon that has been used in the manufacture of sugar.

The charcoal, more or less saturated with coloring matters, that are not taken up by either lime or acids, abandons them with great facility when treated with water, containing a few hundredths of its weight of caustic soda or potassa, or of their carbonates. The liquid is colored yellow, and the charcoal regains its decolorizing properties.

It is necessary to wash the charcoal thus treated with great care, first with boiling water, and then with water slightly acidulated, so as to leave no traces of the alkali or alkaline salt, the presence of which greatly weakens the decolorizing power. In those cases where the charcoal contains a large quantity of lime or carbonate of lime, it is necessary to augment the proportion of the acid in the wash water.

The alkali can be regained from the wash waters by evaporation, if desirable.—*Jour. de Pharm., Dec. 1854.*

Propylamine in the flowers of Cratægus oxyantha.—The natural odor of these flowers recalls that of putrid fish, and is very persistent. M. Wicke, by distilling the flowers with a dilute soda lye, obtained an alkaline distilled water strongly charged with the peculiar odor alluded to, which he saturated with hydrochloric acid and evaporated to dryness. The saline residue, treated with ethereal alcohol, yielded a solution affording a yellow precipitate with chloride of platinum, which he found to be chloride of platinum and propylamine. The buds contain more than the flowers. Wittstein had previously detected this alkaloid (which is the same that gives the herring pickle its peculiar odor) in the flowers of the *Pyrus communis*, *Sorbus aucuparia*, and *Cratægus monogyna*.—*Ibid.*

New variety of Silk Worm from India.—M. Milne Edwards lately stated to the Academy that the *Bombyx cynthia*, a new variety of the silk worm, which feeds on the leaves of the castor oil plant (*Ricinus communis*) had recently been imported from India into France. The silk it produces is inferior to the

mulberry bombyx in fineness, but is remarkably strong, and is used habitually in India by the poorer classes.

The worm is very productive ; it grows so rapidly that six or seven crops are obtained annually, and the plant on which it feeds is easily cultivated. It is proposed to cultivate it in the south of France and in Algeria.

Substitute for Quinine.—A physician at Martinique has discovered a tree, the bark of which affords an alkaloid as valuable as quinine in curing fevers. The subject is under consideration of the French government.—*Lancet*, Jan., 1855, and *Med. News*.

Aldehyde in Vinegar, distilled Vinegar, Wine and Brandy.—M. Lahens, pharmacien of Toulouse, (*Journ. de Pharm. Janv. 1855*), in experimenting on the presence of glucose with Barreswill's test was led to examine into the cause of a reaction that puzzled him, which led the detection of aldehyde in several liquids. His conclusions are,

1. That wine, brandy, vinegar, and distilled vinegar contain aldehyde.

2. That the aldehyde in brandy and distilled vinegar are derived from the fermented liquids from which they are distilled.

3. That crystallizable acetic acid, pyroligneous acid and alcohol of 36° do not contain aldehyde, owing, in the first two instances to the nature of the process that yields them, and in commercial alcohol to the fact that all the acetic acid and aldehyde in the crude liquid are condensed before the alcoholic vapor arrives at the point for its condensation.

4. The absence of aldehyde from brandy indicates that it is artificial.

New test for Sugar in Diabetic Urine.—Mr. John Horsley has published in the *Chemist* a new method of detecting sugar in urine. A freely alkaline solution of yellow chromate of potassa is mixed with the urine and boiled. If sugar be present, the color will change to a deep sap-green color, owing to the reduction of the chromic acid to oxide of chromium. The test is so sensitive that five or six drops of ordinary diabetic urine will give the indication ; which is more sensitive than either Moore's or Trommer's test.

The author does not state whether there is any other body but sugar, that may occur abnormally in the urine, that will react with chromic acid.

Solidified Milk.—The Editor of the *Amer. Medical Monthly* describes the visit made by a committee of the N. Y. Academy of Medicine to the establishment of Mr. Blatchford, in Dutchess county, near Poughkeepsie, in that State, where "solid milk" is manufactured on a large scale. The following is the process pursued. "To 112 lbs. of milk, 28 lbs. of Stuart's white sugar were added, and a trivial portion of bi-carbonate of soda, a tea-spoonful, merely enough to insure the neutralizing of any acidity, which, in the summer season, is exhibited even a few minutes after milking, although inappreciable to the organs of taste. The sweet milk was poured into evaporating pans of enamelled iron, embedded in warm water heated by steam. A thermometer was immersed in each of these water baths, that, by frequent inspection, it might not rise above the point which years of experience have shown advisable.

To facilitate the evaporation—by blowers and other ingenious apparatus—a current of air is established between the covers of the pans and the solidifying milk. Connected with the steam engine is an arrangement of stirrers, for agitating the milk slightly, while evaporating, and so gently as not to churn it. In about three hours the milk and sugar assumed a pasty consistency, and delighted the palates of all present: by constant manipulation and warming it was reduced to a rich, creamy-looking powder, then exposed to the air to cool, weighed into parcels of a pound each, and, by a press with the force of a ton or two, made to assume the compact form of a tablet, (the size of a small brick), in which shape, covered with tin-foil, it is presented to the public."

The pans are carefully washed after each operation. About one thousand acres of pasture land are connected with the establishment, which is admirably situated for the purposes required.

"Some of the solidified milk which had been grated and dissolved in water the previous evening, was found covered with a rich cream. This was skimmed off, and soon converted into excellent butter. Another solution was speedily converted into wine whey, by a treatment precisely similar to that employed in using ordinary milk. It fully equalled the expectations of all; so that solidified milk will hereafter rank among the necessary appendages of the sick room. In fine, this article makes

paps, custards, puddings, and cakes, equal to the best milk, and one may be sure that it is an unadulterated article, obtained from well-pastured cattle, and not the produce of distillery slops. It is considered a great desideratum for travellers, by sea and land, and the best substitute for fresh milk.

Putrefaction prevented by the filtration of air through cotton wool.—Messrs. H. Schröder and Th. de Dusch, in the June number of the "*Annales de Chimie et de Physique*," have published some interesting results in reference to the effect of filtration on air, in depriving it of the power of causing or sustaining putrefaction. The authors put fresh meat with water in a flask closed with a cork rendered air-tight by wax, through which two L shaped tubes passed, one reaching nearly to the meat. The latter was connected with the top of a large vessel filled with water, and acting as an aspirator by opening a cock below; the other was joined by a tight cork to a tube about an inch in diameter, and 23.5 inches long filled with carded cotton, and having a cork perforated by a small glass tube to admit the external air, placed in the opposite end.

The same quantities of water and flesh were exposed in another flask, to the free action of the air, when the water in both was boiled until the air was driven out by the steam, and the juice of the meat coagulated. The aspirator was then put in action by permitting the water to escape by drops, so as to establish a slow but constant current of air through the apparatus, which was continued for 23 days, (in February and March.) At the end of this time, the meat was found fresh and unchanged, whilst that in the open flask had commenced to putrefy in the 2d week, and emitted an insupportably bad odor. The preservative experiment was repeated between 20th April and 14th of May, with the same result.

The authors then tried, whether under the same circumstances, recent beer wort would be prevented from entering into fermentation, notwithstanding its well known tendency to do it. At the end of 23 days it was quite sweet and unchanged.

When, however, milk simply boiled, and meat cooked in a water bath were exposed in the same apparatus, they putrefied as rapidly as in open vessels. Another experiment, like the first, with meat and broth, made in hot weather, was not entirely successful.

The authors believe a certain class of organic decompositions require mere contact of oxygen, as for instance, the formation of lactic acid in milk, and the putrefaction of fresh meat and of casein; whilst in another class, the presence of certain unknown matters [microscopic infusorial plant germs,] which are capable of separation by filtering or of being destroyed by heat, are necessary to commence the change.

REMARKS ON CHEMICAL NOMENCLATURE.

By J. CHESTON MORRIS, M.D.

Among the great improvements of the day in chemistry, we have always been taught to look upon the perfect system of nomenclature now in universal use as holding the first rank. Certainly nothing can be more important to us than a well-defined language, one which there is no reasonable chance of our misunderstanding, if we wish to have the advantage of comparing the results and reaping the benefits of the observation and labors of chemists throughout the scientific world. There is, however, a looseness of expression creeping up in various quarters, which, if generally indulged in, will very much obscure the whole subject of chemical formulæ. This will be best seen by first citing the law and then calling attention to the infractions.

A neutral salt is defined to be one which contains one equivalent of acid for every equivalent of oxygen in the base, as KO , SO_3 , or FeO , SO_3 . Salts containing more than this proportion of acid are called super-salts, per-salts, (or if there be just twice the quantity of acid, bi-salts :) those containing less are called sub-salts.

The state of oxidation of the base commonly enters into the name of the salt when there are several oxides, as, for instance, proto-sulphate of iron, FeO , SO_3 , sesqui-sulphate of iron, Fe_2O_3 , 3SO_3 .

These remarks were suggested by hearing a scientific man of the highest standing in our midst make use of the term, "per-sesqui-chloride of iron;" when asked for the formula of which, he gave Fe_2Cl_3 . Is this correct? On turning to Wood and Bache's Dispensatory, page 1008, a crystallised form of per-nitrate of iron is noticed, as described by Mr. Ordway, of Massachusetts, and called ter-nitrate of the sesqui-oxide. By the rules above laid down, the formula of this salt should be Fe_2O_3 , 9NO_3 , but

we find he only means $\text{Fe}_2 \text{O}_3, 3 \text{NO}_3$. Again, on page 1026, et. al., in speaking of the process for the formation of corrosive sublimate and calomel, the phrase "bi-sulphate of the deutoxide of mercury" occurs. By the law, that a neutral salt must have one equiv. of acid for each one of oxygen in the base, the sulphate of deutoxide of mercury must be $\text{Hg O}_2, 2 \text{SO}_3$; and consequently the bi-sulphate of the deutoxide $\text{Hg O}_2, 4 \text{SO}_3$.

A line or two below, however, we are told that the salt is $\text{Hg O}_2, 2 \text{SO}_3$. The expression, then, is simply redundant, and the use of it too extensive and general to call it a chemical error. It is rather a loose mode of writing and thinking.

The evil effects of it will at once be apparent if we think how we should express the constitution of such a salt, for instance, as $\text{Fe O}_3, 3 \text{NO}_3$, which is likely to be discovered before long. This should be the ter-nitrate of iron, but the danger of confounding it with $\text{Fe}_2 \text{O}_3, 3 \text{NO}_3$ would be almost inevitable. Let the laws of nomenclature be fairly understood, and then we shall not have to resort to long, roundabout, ambiguous terms to express the precise constitution of a salt.

ON RED SANDAL WOOD AND XANTHOSANTALIC ACID.

By JOHN T. PLUMMER, M. D., RICHMOND, IND.

Having occasion to prepare a tincture of this wood, I was led to experiment upon its coloring matter, so as to confirm or disprove the statements respecting it, and, if possible, to extend our knowledge of it. The following notes are the result of my examination.

None of the chemical works in my possession, ever name this dye-wood; and, according to our Dispensatories, it appears to be an article rarely used, either in this country or in Europe, "though still a staple article in the Eastern art of dyeing."

Of great antiquity as a medicine, it is now merely used as a coloring material; nevertheless, I find that *santalin* possesses a very perceptible astringency.

A striking characteristic of red saunders is its insolubility in water; thus differing remarkably from the other dye-woods, as Brazil-wood, logwood, &c. Bancroft, however, ("Philosophy of Permanent Colors,") says a "small portion of its coloring matter is soluble in water;" this may have been apparent, either from the large quantities operated upon by the author, or in conse-

quence of the presence of a portion of Brazil-wood, which, it is said, is sometimes intermixed with the sandal wood. But I know not how to apologize for his statement, that in water, "even when assisted by potash or soda, *the solution is incomplete.*" For, as will be subsequently seen, I found nothing to act so energetically as a solvent of the santalin as potash. Bancroft's assertion would be strictly true if he had said *carbonate* of potash.

I subjected two drachms of the saw-dust of sandal wood, by displacement, to the action of alcohol of the sp. gr. .854, at a temperature varying from 50° to 60°, and found that after nine fluid ounces had passed through, the liquid ceased to be colored. The first few ounces of the filtrate were blood-red; the last drainings, light brownish red; the total filtrate, a rich crimson. The residue in the displacer, when washed in distilled water, still appearing red, was treated with alcohol of greater strength, first cold, then boiling, and under considerable pressure; but scarcely a tinge was given to the spirits.

The alcohol was now decanted, the saunders again washed, and subjected to the action of a solution of potash; this instantly became a dark red: and the saunders filtered out, retained no redness, but when dried had a snuff-brown color; this color is not, I think, owing to the action of the potash on the wood, but to the capillary retention of the compound of potash and santalin among its fibres.

Sulphuric acid, dilute and strong, and hydrochloric acid extract but little color from red-saunders; nitric acid appears to have a greater attraction for the woody fibre than the other mineral acids, and furnishes a raw sienna color.

Acetic acid appears to be one of the best solvents of the coloring matter. It acts promptly on the wood; and by boiling it with the sandal-wood dust, exhausts more of its tinting properties than even alcohol does. It likewise retains the richness of the color of the santalin and makes, without addition, a bright writing ink. Yet, after repeated drenchings with boiling acetic acid, the saunders dust retained, when dried, a perceptible hue of red; but yielded, neither to fresh portions of acetic acid nor to strong alcohol, any color. Solution of potash, however, immediately rendered this otherwise exhausted dust, almost black, like wet ulmin, and extracted a currant-juice color from it. Thus

it is evident that this alkali surpasses all the other agents named, as a solvent of santalin.

There is this, however, against the potash, that it acts as a *chemical* and not a mechanical solvent in this case. For, notwithstanding it acts vigorously upon the sandal dust, and dissolves the far greater part, if not all, of the santalin, the coloring matter in it is of a dark venous-blood color; and when this alkaline solution is applied to pale wood, such as the tulip-tree (*Liriodendron tulipifera*), it retains scarcely the remotest tinge of red, but assumes a snuff color. On unsized white paper it leaves a similar stain. In both cases, according to this view, acetic acid decomposes the compound in the wood and the paper, and restores the red color of santalin. Paper thus prepared, with the potash solution of santalin, makes a tolerable substitute for blue litmus paper, though not so delicately sensitive as that.

Santalin precipitated from its solution in sulphuric acid, is apparently unchanged; concentrated sulphuric acid dissolves santalin without exerting any obvious chemical action upon it.

Nitric acid, on the other hand, changes the color to a sienna hue; and on the sandal wood dust its chemical agency is very manifest, being attended with a prompt and long continued effervescence, extending even to many hours, and resulting in a combination or compound of a yellowish brown color, which is so unalterable that neither concentrated sulphuric acid affects it, (when precipitated by water and washed) nor concentrated ammonia, nor potash, nor any other chemical agent that I subjected it to; except that the alkalies very readily dissolve it.

From some hasty experiments, I infer that this compound acts the part of an acid toward the alkalies, and at least some metals. I will call it, conditionally, and to avoid circumlocution, *Xanthosantallic acid*. Proceeding with this nomenclature, it appears as above that the xanthosantalate of ammonia and of potash are soluble in water.

To the solution of xanthosantalate of potash, I added solution of sulphate of copper. The precipitate obtained was washed, and treated with acetic acid so long as any cupreous compound was formed with this acid. The tar-colored residue on the filter was then washed, and hydrochloric acid added to it on the filter. A tar-colored solution passed through as a filtrate, holding no

copper in solution. Xanthosantalate of ammonia affords a yellowish green salt with sulphate of copper; and this is also readily decomposed by acetic acid, as well as by the mineral acids.

The blood-red precipitate of santalin from its potash solution was well washed, and then boiled with nitric acid till its color was changed to an orange hue and a solution effected. The filtered solution was evaporated to dryness. The xanthosantallic acid thus prepared was found to be soluble in water, ether, alcohol and acids; to have a very astringent taste; just perceptibly to redden litmus paper; to form orange-colored salts with potash and with ammonia; a gamboge-colored precipitate with neutral acetate of lead and with chloride of barium; a light brown precipitate with protochloride of tin and with the salts of iron; but no precipitates with sulphate of copper, bichloride of mercury, alum, chloride of ammonium, nor sulphate of zinc. Xanthosantalate of ammonia, however, and sulphate of copper, decompose each other, and form a precipitate of xanthosantalate of copper of a yellowish green color. A similar reaction takes place with sulphate of zinc, resulting in the formation of a tar-colored precipitate. A solution of alum produced in a few seconds a like precipitate. So does chloride of platinum. But I obtained no precipitates with xanthosantalate of ammonia and chloride of gold, nor with chloride of mercury, nor chloride of ammonium. The protochloride of tin and sesquichloride of iron, the chloride of calcium and chloride of barium, all yielded precipitates, but the last by far the most abundant one. The nitrate of barytes, like the chloride of lime, produced but a scanty precipitate. Chlorate of potash, tartarized antimony and ferro-cyanide of potassium, none.

The action of nitric acid on protein and santalin is followed by the evolution of gas, the production of oxalic acid and the formation of similar yellow, solid acids, the xanthoproteic and the xanthosantallic. Both these acids slightly redden litmus paper, both form soluble orange-colored salts with alkalis, both form colored precipitates with metallic salts. But xanthoproteic acid is without taste; xanthosantallic acid is remarkably styptic; xanthoproteic acid is insoluble in water, alcohol and ether, xanthosantallic is readily soluble in them all. These latter characters are sufficient to distinguish the two acids.

ON THE QUANTITY OF NICOTINA INHALED BY TOBACCO SMOKERS.

The *Journal de Chimie Médicale*, for January, 1855, contains an interesting article on tobacco and nicotina, from which we extract the following:—

M. Malapert, a distinguished chemist and pharmacist of Poitiers, France, has been making researches to ascertain the quantity of *nicotina* which passes into the mouth of a smoker during the combustion of a certain weight of tobacco. He arranged an apparatus for burning the tobacco, consisting of a crucible penetrated by a tube beneath, the opposite end of which passed through a cork in the tubulure of the first of a series of three Woulf's bottles, connected by \cap tubes, the last one being connected with a large tin vessel, filled with water, and furnished with a stop-cock beneath. The first and second bottles were empty, the third contained acidulated water, through which the vapor uncondensed in the other vessels had to pass. Into the crucible he put 50 drachms of smoking tobacco, ignited it, and on opening the stop-cock, a current of air was established through the apparatus, (by the flow of the water,) until the combustion was complete. Nine drachms of ashes remained in the crucible, equal to 18 per cent. of the tobacco burned; consequently, the vapor amounted to 41 drachms, or 82 per cent. About one third of this quantity was condensed in a liquid state, in the first flask; the second was merely moist and stained with pyrogenous matters; the vapor which was found in the tin vessel had a disagreeable odor, which differed from that of tobacco smoke.

The liquid in the first bottle consisted of *water, tar, empyreumatic oil* and *carbonate of ammonia*. It was treated by sulphuric acid, potassa, and dried chloride of calcium, and yielded $4\frac{1}{2}$ drachms of nicotina, or $8\frac{1}{2}$ per cent. of the tobacco. The acidulated water contained but 4 or 5 grains of nicotina, which, with that in the second bottle, which the author did not isolate, made the whole amount to about 9 per cent. of nicotina in French smoking tobacco.

In another experiment, M. Malapert obtained 10 per cent. of anhydrous nicotina.*

These results have an interesting bearing on the popular habit of smoking tobacco. The high boiling point, and consequent ready condensibility of nicotina, causes the most of that poisonous substance to be stopped before it reaches the mouth, in properly arranged pipes; and when the smoking is stopped before all the tobacco is consumed, the latter acts as a means of retaining the poisonous empyreumatic oil.

The volatilization of nicotina is materially aided by the presence of moisture, which accounts for the fact that smokers are much more easily sickened by moist tobacco than by the well-dried leaf.

As the agreeable sensation produced by tobacco smoke depends on the composition of the vapors that are drawn into the mouth, of which *nicotina* makes a part, the preceding statements perfectly explain the different taste (*goût*) that amateurs find at the beginning and end of a pipe or segar. In both cases, at the commencement, the most of the nicotina is condensed in the unconsumed tobacco, from whence it is driven as the fire invades that portion, and reaches the mouth in larger proportion.

The reason that a *new* pipe is said to communicate a bad taste to tobacco, is owing to the absorbent power of the clay, in retaining nearly the whole of the nicotin until it becomes saturated, and hence the narcotic effect of the tobacco is materially decreased.

Finally, the *houka*, and other smoking apparatus used in the East and in India, owe their harmlessness, notwithstanding incessant use, to their construction causing the condensation of nearly all the nicotina before the vapor reaches the mouth of the smoker, owing to its having to traverse a layer of water and to expand in a chamber above. Besides, the tobacco is prepared by the addition of cinnamon, essence of roses, and a little sugar.

As the result of his researches M. Malapert advises smokers, 1st, not to smoke moist tobacco; 2d, to use only those pipes furnished with a condensing chamber; 3d, not to smoke either a pipe or segar longer than till half the tobacco is consumed.

*This proportion is so much higher than the results of M. Schloesing with the strongest kinds of unmanufactured tobacco, that we must either doubt the purity of Malapert's nicotina, or believe that Schloesing did not exhaust his specimens of tobacco.—*Ed. Am. Jour. Pharm.*

SPECIFICATION OF THE PATENT GRANTED TO RICHARD ALBERT TILGHMAN, OF PHILADELPHIA, U. S. OF AMERICA, CHEMIST, FOR IMPROVEMENTS IN TREATING FATTY AND OILY MATTERS, CHIEFLY APPLICABLE TO THE MANUFACTURE OF SOAP, CANDLES, AND GLYCERIN.—Dated January 9, 1854.

The first part of my said invention consists in a mode or modes of obtaining free fat acids and solution of glycerin from those fatty or oily bodies of animal and vegetable origin which contain glycerin as their base.

For this purpose I subject these fatty or oily bodies to the action of water at a high temperature under pressure, so as to cause the elements of those bodies to combine with water, and to obtain, at the same time, free fat acids and solution of glycerin.

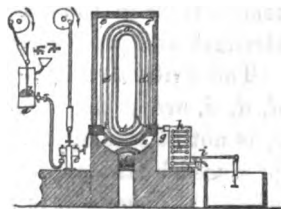
I mix the fatty body to be operated upon with from a third to a half of its bulk of water, and the mixture may be placed in any convenient vessel in which it can be subjected to the action of heat, to a temperature about the same as that of melting lead, until the operation is complete; and the vessel must be closed, so that the requisite amount of pressure may be applied to prevent the conversion of the water into steam.

The process may be performed more rapidly and also continuously by causing the mixture of fatty matter and water to pass through a tube or continuous channel heated to the temperature already mentioned, the requisite pressure for preventing the conversion of the water into steam being applied during the process; and this I believe is the best mode of carrying this part of my invention into effect.

In the drawing hereunto annexed are shown figures of an apparatus for performing this process speedily and continuously, but which apparatus I do not intend to claim as any part of my invention.

Fig. 1, is a vertical section of this apparatus; and

Fig. 2. shows the various parts of the apparatus in horizontal section; I place



the fat or oil in a fluid state in the vessel, *a*, with from one-third to one-half its bulk of warm water; the disk or piston, *b*, perforated with numerous small holes, being kept in rapid motion up and down in the vessel, *a*, causes the fat or oil and water to form an emulsion, or intimate mechanical mixture. A force pump, *c*, like those in common use for hydraulic presses, then drives the mixture through a long coil of very strong iron tube, *d*, *d*, *d*, *d*, which being placed in a furnace, *e*, *e*, is heated by a fire, *f*, to about the temperature of melting lead. From the exit end, *g*, of the heating tubes, *d*, *d*, the mixture, which has then become converted into free fat acids and solution of glycerin, passes on through another coiled iron tube, *h*, *h*, *h*, immersed in water, by which it is cooled down from its high temperature to below 212° Fah., after which it makes its escape through the exit valve, *i*, into the receiving vessel. The iron tubes I have employed and found to be convenient for this purpose, are about one inch external diameter, and about half an inch internal diameter, being such as are in common use for Perkins's hot-water apparatus. The ends of the tubes are joined together by welding to make the requisite length; but where welding is not practicable I employ the kind of joints used for Perkins's hot-water apparatus, which are now well known. The heating tube, *d*, *d*, *d*, is coiled several times backwards and forwards, so as to arrange a considerable length of tube in a moderate space. The different coils of the tube are kept about one-quarter of an inch apart from each other, and the interval between them is filled up solid with cast iron, which also covers the outer coils or rows of tubes to the thickness of half or three-quarters of an inch, as shown in fig. 2. This casing of metal insures a considerable uniformity of temperature in the different parts of the coil, adding also to its strength and protecting it from injury by the fire.

The exit valve, *i*, is so loaded, that when the heating tubes, *d*, *d*, *d*, are at the desired working temperature, and the pump, *c*, is not in action, it will not be opened by the internal pressure produced by the application of heat to the mixture, and therefore when the pump, *c*, is not in action, nothing escapes from the valve, *i*, if the temperature be not too high. But when the pump forces fresh mixture into one end, *j*, of the heating tubes, *d*, *d*, *d*, the exit valve, *i*, is forced open to allow an equal amount of the

mixture which has been operated upon to escape out of the cooling tubes, *h*, *h*, at the valve, *i*, placed at the other end of the apparatus. No steam or air should be allowed to accumulate in the tubes, which should be kept entirely full of the mixture. For this purpose, whenever it may be required, the speed of the pump should be increased, so that the current through the tubes may be made sufficiently rapid to carry out with it any air remaining in them. Although the decomposition of the neutral fats by water takes place with great quickness at the proper heat, yet I prefer that the pump, *c*, should be worked at such a rate in proportion to the length or capacity of the heating tubes, *d*, *d*, *d*, that the mixture while flowing through them should be maintained at the desired temperature for about ten minutes before it passes into the refrigerator or cooling parts, *h*, *h*, of the apparatus.

The melting point of lead has been mentioned as the proper heat to be used in this operation, because it has been found to give good results; but the change of fatty matters into fat acids and glycerin takes place with some materials (such as palm oil) at the melting point of bismuth, yet the heat has been carried considerably above the melting point of lead without any apparent injury, and the decomposing action of the water becomes more powerful as the heat is increased. By starting the apparatus at a low heat and gradually increasing it, the temperature giving products most suitable to the intended application of the fatty body employed, can easily be determined.

To indicate the temperature of the tubes, *d*, *d*, *d*, I have found the successive melting of metals and other substances of different and known degrees of fusibility to be convenient in practice. Several holes, half an inch in diameter and two or three inches deep, are bored into the solid parts of the casting surrounding the tubes, each hole being charged with a different substance. The series I have used consist of tin, melted at about 440°, bismuth at about 510°, lead at about 612°, and nitrate of potash at about 660°. A straight piece of iron wire passing through the side of the furnace to the bottom of each of the holes, enables the workman to feel which of the substances are melted, and to regulate the fire accordingly. It is important for the quickness and perfection of the decomposition that the oil and water during their entire passage through the heating tubes should remain in the

same state of intimate mixture in which they enter them. I therefore prefer to place the series of heating tubes in a vertical position, so that any partial separation which may take place while the liquids pass up one tube, may be counteracted as they pass down the next. I believe that it will be found useful to fix at intervals in the heating tubes of such apparatus as may admit of such an addition, diaphragms pierced with numerous small holes, so that the liquids being forced through these obstructions may be thoroughly mixed together. I deem it prudent to test the strength of the apparatus by a pressure of 10,000 lbs. to the square inch before taking it into use; but I believe that the working pressure necessary for producing the heat I have mentioned, will not be found to exceed 2000 lbs. to the square inch. When it is desired to diminish the contact of the liquids with iron, the tube or channels of the apparatus may be lined with copper.

The hot mixture of fat acids and solution of glycerin which escapes from the exit valve of the apparatus are separated from each other by subsidence; the fat acids may then be washed with water, and the solution of glycerin concentrated and purified by the usual means.

The fat acids thus produced may, like those obtained by other methods, be used in the manufacture of candles and soap, and applied to various purposes according to their quality; and when desired they may also be first bleached or purified by distillation or otherwise, as is now well understood.

I prefer that the fatty bodies should be previously deprived, as far as practicable, of such impurities as would cause the discoloration of the fat acids produced; but when the fat acids are to be finally purified by distillation, this preliminary purification is of less importance.

When any acid or other corrosive agent shall have been used for purifying, hardening or otherwise preparing the fatty body to be operated upon, I take care that all traces of it shall be washed out or neutralized before passing it through the apparatus. Some fatty bodies (particularly when impure) generate during the process, a portion of acetic or other soluble acid, which might tend to injure the iron tubes; in such cases I add a corresponding quantity of alkaline or basic matter to the water and oil before they are pumped into the tubes.

The second part of my said invention consists of a mode of treating a mixture of fatty matters, (whether acid or neutral) and a carbonated alkali for the purpose of manufacturing soap.

For this purpose, I mix the fatty bodies in a liquid state with the quantity of carbonated alkali in solution which may be necessary to convert it into soap, and then subject the mixture to a high temperature under pressure, in like manner as hereinbefore described in practising my mode of obtaining fatty acids and glycerin. And for this purpose the apparatus hereinbefore described for producing the fatty acids and glycerin by a continuous process may be used for the production of soap in a similar manner. The carbonated alkali may be dissolved merely in the quantity of water which is intended to remain in the soap produced. If resinous or other matters are intended to be used in the manufacture of the soap, they may be dissolved either in the alkali solution or the oil, or may be combined with the soap after it has left the apparatus.

The degree of heat required is less than that which is necessary to produce free fat acids, and should generally be kept between the melting points of tin and bismuth. At about 350° Fah. the neutral fats will form soaps, with the solution of alkaline carbonates, but a higher temperature will produce the result more quickly.

The carbonic acid expelled from the alkali in this process, when performed in the apparatus above described, escapes as the soap issues from the exit valve; if but little water has been used, and the quality of the soap is sufficiently good without further purification, it can be put into frames to harden at once, or it may be put into the coppers, boiled up, and separated from the glycerin (when neutral fats have been used,) and finished in the usual manner.

I claim as of my invention,—

First, the manufacturing of fatty acids and glycerin from fatty bodies by means of water and heat acting thereon, as hereinbefore described; and

Secondly, the manufacturing of soap by treating a mixture of fatty matters and a carbonated alkali, as above described.—*Jour. Franklin Institute, Jan. 1855, from Repert. Pat. Invent. Nov. 1854.*

OBSERVATIONS ON THE ANTIMONIAL POWDER OF THE LAST DUBLIN PHARMACOPŒIA (1850,) AND ON THE MEDICAL EFFECTS OF THE TEROXIDE OF ANTIMONY.

BY JONATHAN OSBORNE, M. D.,

King's Professor of Materia Medica, Physician to Mercer's Hospital, &c.*

It is well known that the antimonial powder of the Pharmacopœias was first adopted as an imitation of Dr. James's fever powder, but the opinion has for a long time been gaining ground among practitioners that it is nearly, if not altogether, inert. I have given it in various doses, large and small, and long ago made a series of trials expressly on this subject, but could never perceive any sensible effect except when combined with calomel. A powder of two grains of calomel and four of antimonial powder, taken at night, was not unfrequently followed by perspiration; but when given alone it never appeared to me to have any effect, and I am thus fully enabled to confirm the statements as to inefficiency, made by Mr. Hawkins, Dr. Duncan, and Dr. Elliotson.

That it should be thus inactive may be explained from the fact that the antimony is almost entirely in the form of antimonious acid, and that the proportion of teroxide of antimony it contains is insignificant, never amounting to four per cent, according to Dr. MacLagan, and totally absent in some samples according to the experiments of Mr. Philips.

In the *Philosophical Transactions* for 1801, Mr. Chenevix described a mode of preparing antimonial powder in the humid way, in which teroxide of antimony was precipitated from the hydrochlorate by ammonia. It was strange that although this process was referred to in terms of high commendation by almost all the succeeding writers on pharmacy, and was admitted to possess the great advantage of uniformity of oxidation, of which the process by heat was unsusceptible, yet that it never was admitted into any of the Pharmacopœias. It was not till the publication of the Dublin Pharmacopœia in 1850, that a mode of preparing the powder by precipitation appeared, and in this a great improvement was introduced by using tartar emetic instead of the solution in hydrochloric acid which Mr. Chenevix had employed. This

*Read before the Association of the King and Queen's College of Physicians.

preparation, however, though bearing the name of antimonial powder, is yet different from it in one respect, and that the most important, in all the antimony it contains being exclusively in the state of teroxide. It has therefore appeared to me desirable to ascertain its medical effects by actual experiment. The only account of the effect of the powder, as prepared by Mr. Chenevix, that I can find, is contained in the following words, with which his paper concludes :—"I gave some of my powder to Dr. Crichton, Dr. Babington, and Mr. Abernethy, gentlemen whose extensive practice and acknowledged skill sufficiently enabled them to judge of its medical properties. They all concur in opinion, that in its general effect it agrees with Dr. James's powder and the pulvis antimonialis, but that it is more mild, and consequently may be given in larger quantities, seldom producing nausea or vomiting, in doses of less than eight or ten grains." The results I have obtained are very different.

I have tried it in twenty cases, selected for careful observation in Sir Patrick Dun's Hospital. The powder was prepared according to the process of the Dublin Pharmacopœia, 1850, by Mr. Morgan, whose accuracy and ability are well known. The dose given in every instance was five grains in the evening and the same at bed time. The cases were chiefly rheumatism, pneumonia, and bronchitis, and the patients were all adults. In order to present a view of the percentage of the effects, and to facilitate recollection and comparison with other observations, I have reduced them to the form of decimals.

TABLE of the Effects of the Pulvis Antimonialis of the Dublin Pharmacopœia, 1850. Dose five grains evening and night.

More or less gentle action on the bowels.	Nausea.	Vomiting.	Perspiration.	Perspiration without Nausea.	No perceptible effect.
.50	.45	.20	.65	.20	.10

In order to ascertain the effect of the teroxide of antimony taken separately, I tried some prepared by Mr. Morgan, according to the Dublin Pharmacopœia, 1850. It was given in three grain doses evening and night, and to the same average class of cases as the above, selected in Sir Patrick Dun's and Mercer's Hospitals.

TABLE of the Effects of the Teroxide of Antimony (Algaroth's Powder,) given in doses of three grains evening and night.

More or less gentle Action on the Bowels.	Nausea.	Vomiting.	Perspiration.	Perspiration without Vomiting.	No perceptible Effect.
.60	.40	.15	.70	.40	.05

In order to try how far the action of the teroxide could be influenced by the presence of acids, I selected six of the cases in which there had been no effect, or only perspiration, and added to each dose the same weight of nitric acid. The result was in every case either nausea, vomiting or purging. Hence it appears that the teroxide is capable of combining with acids in the stomach, and of forming salts resembling tartar emetic. I find also that the addition of one or two grains to small doses of either rhubarb or aloes produces a remarkable augmentation of the purgative effect of these articles.

The conclusions to be deduced from my observations are :—

1st. That the antimonial powder of the present Dublin Pharm. (1850) differs from that hitherto prepared, not only by containing the antimony exclusively in the state of teroxide, but by medical effects of which the older preparation is nearly if not quite destitute.

2nd. That as it has not been identified by a distinct name (which is to be regretted,) the prescriber should, to avoid confusion, always distinguish it as the antimonial powder of the Dublin Pharmacopœia of 1850.

3d. That the teroxide of antimony (Algaroth's powder,) inasmuch as it contains all the active part of antimonial powder, may be safely substituted for it, the phosphate of lime not contributing to its virtues, and having been at first accidentally associated with it in consequence of the imperfect chemistry of the time when the original process was devised.

4th. That the average maximum dose of the teroxide of antimony, as a diaphoretic for an adult, is three grains evening and night.

5th. That the addition of acids renders it more emetic and more purgative.

6th. That the occasionally violent effects ascribed to it by some of the older writers were most probably due to the presence of chloride of antimony, from want of care in the preparation, and that this may be most effectually excluded by precipitating it from tartar emetic by means of an alkaline solution.—*The Dublin Quarterly Journal of Medical Science, and Pharm Jour.*

ON LIQUOR AND EXTRACTUM TARAXACI AND OTHER
EXTRACTS AND EXPRESSED JUICES.

BY MR. R. W. GILES.

The few remarks which I have to offer are so hastily arranged that they ought to be prefaced by a longer apology, if it were not my belief that the Pharmaceutical meetings would be benefited if more rashness was manifested by Members. These observations are rather designed to suggest a subject for consideration, than to describe the result of any sufficiently elaborated investigation.

At the present time, the first that has ever offered to the Pharmaceutical body an opportunity of sharing in the preparation of the Pharmacoposia by which their operations are to be guided, it seems particularly desirable that our views should be sufficiently comprehensive, that we should not commence our labors by a seriatim revision of preparations in an isolated condition, but rather with a consideration of the objects which the several classes of pharmaceutical preparations are intended to subserve. For example, it might be a subject for consideration whether the tinctures are not inconvenient from containing so large a proportion of alcohol to the medicine intended to be conveyed, as often to interdict their administration in efficient doses. This may not be the best illustration possible, but it will serve as an illustration of the propriety of considering first how tinctures are likely to be employed, and afterwards how any particular tincture will be best made.

The class of preparations to which I wish now to refer, are "*Extracts*," and I would propose it as a subject worthy of serious thought: "What is the object in view in the preparation of extracts?"

This form of medicine is obviously intermediate between the crude drug and the alkaloid, resin, or what not, to which the efficacy of the drug is supposed to be due. In some cases the active principle is obscure, as in hyoscyamus, and the extract is a convenient approach to that which cannot be easily obtained. In other cases, as of nux vomica and aconite, the alkaloids are too deadly to be manipulated without anxiety, and the alcoholic extract is preferred as being more tractable.

It is clear, therefore, that the extract is sometimes preferred for its concentration, and sometimes for avoiding an ultimatum concentration, and this diversity of object leaves some margin for the interpretation of the desideratum in extracts.

It is, however, worthy of consideration whether some modification of the present processes might not be advantageously suggested by keeping these objects in view. These reflections have been chiefly occasioned by some experiments with taraxacum juice. The curative value of this plant seems generally accepted, yet it is a singular fact that we have but one authoritative formula for its manipulation, which yields a very unsatisfactory result in the form of extract of taraxacum, which is now very rarely employed when the specific effects of the plant are desired; it is chiefly confined to the office of blending pills, with only a secondary importance attached to its presence.

Other preparations exist, so various as to occasion great perplexity to us, and not unfrequently to impress wandering customers with the suspicion of our inaccuracy, on account of the opposite appearances which one or another will cause in their medicines. They may, however, be considered in two classes:—the inspissated juices, introduced by Mr. Hooper, or the more fluid liquors, by Mr. Squire. I believe that grave objections apply to each, which I propose cursorily to observe upon. The inspissated juices contain an excessive proportion of inert quasi-starchy matter. The fluid liquors are largely impregnated with sugar.

In common with many others, I have found great caprice in the appearance of the expressed juice, and its behaviour during inspissation. Sometimes it has appeared thick, and of a pale drab color, and on standing for a short time (say half an hour) has become pulpy. In this condition it bears a very small degree of evaporation before it becomes so thick as to put a period to the process. The result is then of a drab color, and agrees very closely with Mr. Hooper's preparation, becoming opalescent, when diluted with water, resembling, as Mr. Hooper himself states, the milky juice of the root.

At other times the juice is darker in color, very much more fluid, and nearly free from any of the quasi-starchy deposit. It

bears a considerable diminution of the volume without assuming the pulpy appearance, and ultimately becomes a muddy looking extract without passing through that state. It has also been my experience that juice originally possessing this character is prone to become sour during the evaporation, even when this is conducted with great care. These differences, which might be supposed to be due to the condition of the root at various seasons of the year, are not solely influenced by this cause, for I have found them exhibited in the operations of two consecutive days upon roots obtained from the same source; and I am inclined to believe that it is occasioned by the comparative length of time between gathering and pressing, even more than the period of year at which the collection of the roots takes place.

Further to elucidate the matter, some examination of the juice seemed necessary, the results of which I beg to submit:—

1st. A specimen of the drab-colored puddly juice became clear by boiling, so far agreeing with the behaviour of starch.

2nd. When treated with iodine it gave no blue iodide of starch.

3rd. The iodine added in the last experiment was occupied so as to lose its action upon gelatinous starch subsequently added.

4th. When examined under the microscope, there was no evidence of well defined starch grains, but abundance of irregular peculiar bodies without color, but otherwise very much resembling the endochrome of ordinary parenchymatous cells. There were also diffused through it occasional groups of cylindrical cells placed end to end, some of the cells still full of these granular bodies, some empty, some ruptured and discharging their contents.

5th. The juice gave slight indications only of sugar when examined by Trümmer's test, even after inspissation, and would of course have been likely to have afforded still less before having been subjected to the action of heat, though this would probably vary according to the season.

6th. The endochromatous matter was found to be easily converted into sugar by boiling in the presence of SO_3 .

Sufficient observations of the less turbid, darker juice, were

not made, owing to the hasty manner in which the matter was attended to; but so far as they went they indicated a smaller presence of the endochrome. This indeed is sufficiently expressed in the description of it as a juice wanting the *thickness* which distinguishes the other.

I believe the cause of this variation may be thus correctly explained :—

While the root is fresh, and before the cessation of vital action has produced a change in the juices, the cells containing the endochrome are more easily ruptured, and the endochrome itself is more perfectly suspended in the juices, and more freely yielded to expression.

It is also possible that a period of delay may allow a process of fermentation to be imitated, which may explain the greater disposition of the more fluid juice to become sour during evaporation at a moderate temperature.

The fluid “Liquors of Taraxacum,” which I believe are generally made by a certain evaporation of the juice and addition of spirit, with subsequent filtration to separate the starchy matter, universally, so far as I know, abound in sugar.

We have now to consider the influence, in a pharmaceutical point of view, of the presence of this large proportion of endochrome in the one case, and of sugar in the other.

In the first place, I maintain that the endochrome gives rise to a very fallacious estimate of the preparation in which it occurs. We are prone to consider that the great aim is to achieve a *pale drab-colored fluid*, which shall give a *milky mixture with water*, the first of these features being in fact an indication of the absence of any large proportion of that soluble matter which we assume to carry the medicinal property of the taraxacum, and the second, of the copious presence of inert matter.

In the case of the fluid liquors we find a portion of the endochrome has been converted into its other inert modification of glucose, and still contaminates the product, and this presence is generally held to be objectionable, but probably the greatest objection to this, as to the other, is, that they are not sufficiently concentrated to make the usually prescribed doses of any avail.

All that has been said of the two types of liquid taraxacum

applies with increased force to the corresponding extracts—the ordinary P. L. extract, which is so notoriously contaminated with glucose, being represented by the liquor taraxaci, and that other form of opaque extract which has recently been proposed as its substitute agreeing with the inspissated juice—the sugar of the P. L. extract renders it objectionable, and the large proportion of the endochrome present in the other dilutes it in a manner that mitigates against the intention of an extract.

The application of these observations is in determining the best means of getting in the form of a fluid or an extract, the largest amount of the active agency of taraxacum in the smallest volume, and I am inclined (though with insufficient experience) to think that two ways offer the means.

First, by allowing the roots to become somewhat flaccid by exposure, by which means I anticipate that less endochrome would be separable, and then to bruise and press them, sprinkling with water if found advantageous.

Second, to operate upon dry roots by cold maceration.

By neither of these processes could we obtain the pulpy-looking inspissated juice which we have learned to desire, but in my opinion this is no loss, as I have before stated my belief that this appearance is the measure in point of thickness of the inert matter present, and in point of color of the small extent to which concentration has been carried.

We may further apply these considerations to extracts generally, and reflect whether we ought not to reduce their volume as much as possible, in order to make them fulfil their purpose, one part being of course the administration of an average dose in a pill, and whether it should not be our aim in the new P. L. to exclude inert matter, such as starch and albumen, from all of them. By these means the extracts even from drugs originally very different in quality would be assimilated, and one of the difficulties of adjusting their doses would be surmounted. A step in this direction was taken in the P. L. of 1851, by the substitution of cold maceration for boiling in several cases, due, I suspect, to the suggestions of Mr. Battley; but it is still a question whether much more does not yet remain to be done by similar means, and by the further employment of alcohol and

ether as solvents. There will doubtless be a smaller product to the manipulator, just as one sovereign is of less volume than twenty shillings; but the possessor of the sovereign scarcely needs our sympathy; neither should we deserve consideration if narrow-minded notions led us in a direction opposite to the welfare of the sick—of which, however, there is no cause for apprehension.—*London Pharm. Jour.* Dec. 1854.

ON THE STRUCTURE OF THE STARCH GRANULE.

BY MR. JAMES JOHN FIELD.

The physical characters exhibited by the lowest forms of animal organisms appear so closely allied to those found in certain plants, that it is still an unanswered question, how those forms may be correctly referred to the kingdom of which they really form members.

In less equivocal cases *general* distinctions are had recourse to, but such distinctions are inapplicable to the forms of which I now speak, and therefore is it that the necessity for some *specific* distinction has become recognized.

But although many investigators have devoted attention to this subject, no one seems yet to have indicated any peculiarity of structure in either the animal or vegetable kingdoms, which may be available as a *positive line of demarcation* between them. For the solution of this problem we must doubtless rely upon the advancing powers of the microscope, which are daily making us better acquainted with the proximate elements of organic structures; and from this consideration every microscopic observation tending to elucidate the nature of these elements should be recorded.

It is under this impression that I make the following observations upon the structure of the starch granule; for notwithstanding that the subject has been already ably treated by various writers, some maintaining its membranous, and others its non-membranous character, the question does not seem hitherto to have been so absolutely decided as to render additional evidence unnecessary.

By availing myself of the peculiar organic property of endosmose, I have obtained what I believe to be the most complete and demonstrative evidence of the existence of a membrane

around the starch granule ; and I believe it will be generally admitted, that the action I am about to describe can only be accounted for on the premise that such membrane really exists.

I took a small quantity of the starch of *Canna edulis*, and having completely saturated it with pure glycerine on a glass slide, I covered it with a disc of thin microscopic glass.

It occurred to me, that if the granules were surrounded by a membrane, and the glycerine allowed to penetrate to their contents, the subsequent addition of a little water, by diminishing the gravity of the external fluid, would call the principle of endosmose into play ; that the fluid contents of each granule would increase in volume by endosmotic action, and therefore, that unless the surrounding membrane were very distensible it would be ruptured.

On examination by the microscope I found this to have been the case. The granules had split open, and bore on their external surfaces distinct evidence of a membrane that had been corrugated by release from unusual tension ; the membrane around some of the granules being visible in distinct longitudinal wrinkles, from the hilum downwards.

Were the starch granules composed of superposed laminae only, as some observers have maintained, it is not comprehensible why the addition of water, as before described, should rupture them ; and even admitting the possibility of this occurring, through some agency not understood, the conclusion is almost irresistible, that the rupture would then have been in the direction of the laminar surfaces, whereas, being from the hilum downwards, it was, of course, at right angles to those surfaces.

The fact of the fracture always occurring in the direction of the axis may be readily accounted for, by adopting the supposition that the concentric lines, observable upon the surface of the granules, are simply plications of the membrane, admitting thus of its extension from one extremity to the other, but not laterally. This would, of course, necessitate the fracture being, as I have observed, in the direction of the axis, and this view derives much support from the circumstance of the concentric lines having disappeared during the progress of the experiment.

From these observations then it would appear, that starch consists of granular matter, enclosed in a membranous vesicle, of

very sparing distensibility ; and that the superficial markings are simply minute folds in the membrane, probably caused by some contraction that the granule undergoes in passing from the fresh state, as it exists in the plant, to the dry form:

2, Southward Terrace, Highgate.

The CHAIRMAN said, that Mr. Field's experiments tended to confirm the views which had been entertained by other observers ; such, for instance, as Mr. Geo. Busk, who, in December, 1852, before the Microscopical Society, read a clever and interesting paper " On the Structure of the Starch Granule." His reasons carried great weight, one of the strongest arguments being founded on the action of heat and other agents which cause the granule to swell, and before bursting, the concentric lines were found to disappear ; thus tending to prove that the lines are on the surface. Still he (Mr. Deane) had not been able to satisfy his mind that such views were altogether correct. He rather inclined to those of Schleiden and others, and more particularly those of the late Dr. Pereira, who, when preparing his last edition of the *Elements of Materia Medica*, devoted much time to this difficult question. Dr. Pereira considered the granule to consist of concentric layers, inclosed in a smooth, tough membrane or cell. The models on the tables, designed by him, and made expressly to illustrate his lectures, would in some degree explain his views. Mr. Field considered the concentric markings to be external corrugations ; and Mr. Busk and others, that these corrugations are on one side only. Now these markings were found to exist equally in starch fresh from the tuber as in that which had been dried, and therefore they could not be the effect of any shrinking by loss of moisture. In the case of Yam starch, which consists of flat grains, it would be observed, on looking on its flat side, that the rings followed the broad outline, and on looking on the edge that they equally followed the narrow outline, results similar to what would be obtained on viewing in the same way a nest of flat glass shades. If a little Yam starch were placed in water between two pieces of glass under the microscope, most of the grains would appear on their flat sides, but some few would be on edge, or if not, they might be made to turn over, so as to show their edges, by giving a slight lateral movement to the covering glass, when they may be readily observed in every position. This peculiarity of marking, he thought, was not much like mere external corrugations, but more like the effect produced by superposed layers, and he believed it was this starch, so well adapted from its form to demonstrate the theory, that confirmed Dr. Pereira in the opinion he entertained. It did not follow that because there were concentric layers of matter there should be concentric membranes enveloping those layers, any more than that there should be a tough bark investing every annulation in an exogenous stem. That there was one general investing membrane or cell there was no difficulty in showing.

If a little boiling water were poured on to starch, and it were then examined under the microscope, an abundance of empty collapsed cells would be observed; and if this aqueous solution of starch were to be largely diluted with water they would all gradually fall to the bottom of the vessel.

So little was known of the mode of growth of the starch cellule that it was impossible to say at present how the increment takes place. It may be uniformly, or it may be periodic, the difference between night and day possibly being sufficient to account for the difference in density of the layers; that is to say, supposing the markings to indicate concentric layers—just as the seasons appear to affect the density of the annular rings in the stems of trees. With regard to the direction of the fissure on the bursting of the granule, longitudinally would be the natural direction in a body constituted of concentric layers; at least, it was very doubtful if the concentric layers would offer any impediment to such a mode of splitting. From what is observed in reference to exogenous stems, one would infer that there would be a greater facility for rupture in that direction. Wood splits readily in the direction of its axis—that is longitudinally, not at all transversely, or at right angles to it, and in many instances not readily in the direction of the annulations, or perpendicularly to the medullary rays, and in some of the coniferæ this tendency is extensively rendered available in the production of laths for ceiling and roofing purposes.

Having seen Mr. Field's paper before it was read, he had tried the experiment referred to in it, but the result had not satisfied him that the appearance observed was due to the rupture of the granules. He was rather disposed to refer it to a shrinking of the granule and consequent puckering of the enveloping membrane. His observations, however, had been somewhat hastily made, so that he could not give a decided opinion. He thought that a further investigation of the subject was required, and that many more observations must be made before either of the theories which had been propounded could be considered as established.

Mr. GILES said, as the Chairman seemed to differ from the author of the paper as to the cause of the appearance presented by starch granules when immersed in solution of glycerine, the latter describing the action as that of a swelling of the granule and a bursting of its envelope, while the former considered that a reverse action took place, he thought it desirable that some experiments should be made to determine the mode of action of aqueous solution of glycerine and of starch on membrane. If it should be found that, in accordance with the usual phenomena of endosmose and exosmose, a thin solution of glycerine permeated membrane more quickly than the thick gelatinous contents of the starch granule, this would afford a strong argument in favor of Mr. Field's opinion.

Dr. EDWARDS thought the question a very difficult one to decide, and therefore one upon which much difference of opinion would probably continue to exist. The Chairman appeared to meet Mr. Field half-way, for

while the latter combated the notion that the markings in starch granules were due to the existence of a succession of layers or strata without any distinct covering or envelope, contending that there was an outer membrane which was permeated by a dilute solution of glycerine; the latter admitted the existence of the membrane, although denying the endosmotic action of solution of glycerine, and at the same time contended that the markings were due to concentric layers within. He had, himself, in submitting starches to microscopic examination, observed certain phenomena, some of which were in favor of one and some of the other of these views. Thus, dilute acetic acid, while it caused a swelling of the granules, rendered the markings more distinct. On the other hand, gelatine and most of the media employed for mounting microscopic objects, sooner or later, caused the entire disappearance of the markings. So much indeed was this the case that a good medium for mounting the starches so as to show the markings was still a desideratum.

Mr. BENTLEY said the structure of the starch granule had always been an interesting subject, that it was more particularly so at the present time, when starch, or at least a substance almost identical with it, had been found in animal structures, and thus its presence could no longer be relied upon as an absolute distinctive character between an animal and a vegetable. With regard to the structure of the starch granule, he had always been a firm believer in Schleiden's views in all their essential points, and he had been strengthened in this belief by repeating the experiment of Mr. Busk and Dr. Allman. That the starch granules consisted of a series of hollow scales or shells placed over one another, appeared to him to be supported by the results of many experiments and observations. Thus, if the cells of the potato were examined when very young, the contained starch would be seen to consist chiefly of minute granules scattered amongst larger ones, whilst in the cells of old potatoes the two different sized granules were observed, but here the smaller granules were comparatively few in proportion to the larger. The smaller granules were nearly spherical in form, while the larger were ovate or more or less irregular in their outline; but it was observed that the inner zones of the larger granules were nearly spherical, corresponding in appearance with the small granules. From these facts it was inferred that the small granules became the nuclei of the larger, and that they were augmented in size by successive depositions of concentric layers from within outwards, the outer layers becoming gradually more irregular. The experiments of Dr. Allman tended to show, that if starch be left for several weeks in a dilute solution of iodine and then examined by the microscope, the appearance of concentric layers became more evident; and that on the addition of a drop of dilute sulphuric acid the granules immediately began to swell, and when the swelling had ceased the scales were found to be more or less separated from one another. It had also been found that when starch was heated on a metallic plate until

it began to assume a brown color, on examining the granules with the microscope the nuclei were observed to be enlarged and the striæ rendered more distinct, results which were ascribed to the action of vapor produced by the heat, within the cavities. Another experiment which had been tried consisted in mixing starch with gum-water, and after allowing the mass to dry, cutting it into very thin slices, when many of the granules were found to have been cut through, and on examining these sections with the microscope, especially after treating them with solution of iodine and dilute sulphuric acid, strong evidence of the existence of separate layers was obtained. By these and other experiments he thought it had been pretty clearly shown that the starch granule was composed of a series of hollow scales, and he believed with Schleiden and others, that these were deposited from within outwards. Another question, however, presented itself, namely, are the different layers in the granule of the same chemical composition, or of the same relative density? He considered that the layers varied in density, the inner layers being more aqueous and gelatinous than the outer, which appeared generally to be altogether of a tougher consistence. He thought the layers had all the same chemical composition in the larger and perfectly formed granules, but it might be doubted whether the small rudimentary granules did not consist of a transitional substance not identical with starch, but which would become starch.—*Transactions Pharm. Society, in Pharm Jour. Dec. 1854.*

NEW RESEARCHES ON STARCH.

BY M. A. BÉCHAMP.

During some researches on xyloidine, the author has studied the action of nitric acid, sulphuric acid, crystallizable acetic acid, chloride of zinc, and caustic alkalies upon starch. He considers that the insolubility of starch is not dependent upon its organization, and that the substance soluble in cold water, known to chemists as *dextrine colorable by iodine*, is a modification of starch intermediate between it and pure dextrine.

If starch be treated with very concentrated nitric acid (a mixture of equal parts of $\text{NO}^5 4\text{HO}$ and $\text{NO}^6 \text{HO}$), it is first of all converted into a thick paste, which at last dissolves in an excess of acid.* The addition of a sufficient quantity of concentrated alcohol separates the whole of the starch in the form of a sticky mass, which, when washed with alcohol, is reduced to a white powder, perfectly neutral to litmus paper. This substance is

* The liquid obtained is entirely soluble in cold water, so that no xyloidine can have been formed.

slightly soluble in cold water, but nine-tenths of it are insoluble in that fluid. But if the sticky mixture of starch and acid be left to itself for from forty-eight to sixty hours, or heated until the appearance of reddish vapors, it becomes completely liquefied, and the starch may still be entirely separated by concentrated alcohol. The product, washed with alcohol to remove adherent acid, is then completely soluble in cold water. In all cases both the soluble and insoluble matters acquire a blue color by iodine.

A thick mixture of starch and concentrated sulphuric acid, $\text{SO}^3 \text{HO}$, treated with alcohol after about four minutes contact, behaves exactly like the mixture of starch and nitric acid; the starch is entirely separated, and becomes partially soluble in cold water. But when the mixture is left for half an hour, the starch separated by the alcohol has become completely soluble in cold water.

Crystallizable acetic acid, heated to 212°F . with starch, in a sealed tube, converts it into the soluble modification in from three to five hours; the starch grains are not deformed or dissolved; they are merely split (but not exfoliated) in the region opposite to the tube. Ordinary acetic acid acts more quickly upon starch, and may convert it into dextrine under the same circumstances.

A concentrated solution of fused chloride of zinc, free from acid, converted starch into a paste in the cold. This paste liquefies in a few hours when heated to 212°F . The mixture may be heated to 284°F . without the formation of any trace of dextrine; but the starch separated from this zinc solution by alcohol may, according to the duration of the reaction, become entirely soluble in cold water.

Starch heated in a *very concentrated* solution of caustic potash or soda, loses the whole of its [?] nitrogen in the form of ammonia. The author confirmed this evolution of ammonia, not only by test paper, but also by converting this alkali into the double chloride of platinum and ammonium. When the caustic alkali is saturated with acetic acid, the addition of alcohol separates the whole of the starch. A small quantity has become soluble, but the greater part remains insoluble, not only in cold, but even in boiling water. Dextrine is never formed by the action of caustic

alkalies. The insoluble disorganized starch no longer forms a paste with hot water, but by the action of acids it may be converted into soluble starch, and afterwards into dextrine. The author's memoir contains details showing the insensible passage of insoluble starch to the state of soluble starch.

He considers that his experiments leave no doubt that starch is insoluble in all its parts, although formed of strata of different ages, the most recent being the most readily altered.

The following properties of soluble starch serve to distinguish it from dextrine :—

1. It is colored blue by tincture of iodine.
2. Tannic acid produces a precipitate with it, as in the apparent solution of ordinary starch.
3. It causes turbidity in lime water, and produces an abundant precipitate in baryta water. Carbonic acid separates it unchanged from its baryta compound.
4. Its molecular rotatory power is much greater, but in the same direction ; it is $[\alpha]_D^{20} = 210^\circ$.

The solution of soluble starch passes pretty readily through the pores of an animal membrane.

If starch-paste be boiled in water and filtered, the filtrate will not contain more than 0.338 per cent. of starch. This solution becomes turbid when it is concentrated on the water-bath ; the starch separates, and the liquid when filtered does not contain more dissolved matter than before the evaporation. A solution of soluble starch, on the contrary, may be evaporated to a syrupy consistence without turbidity.—*London Chem. Gaz*, from *Comptes Rendus*.

ON THE OIL OF THE PURGING NUT (CURCAS PURGANS ?)

By J. BOUIS.

A plant of the family *Euphorbiaceæ*, which occurs in the West Indian Islands, produces fruits presenting certain analogies with those of the castor oil plant. These fruits, known as purging nuts, contain a kernel which tastes like a nut, but the very active properties of which are soon discovered when two or three of them have been eaten. During my experiments, several people

having seen and tasted them, experienced very disagreeable effects.

By pressure they furnish a white oil, the density of which is 0.910 at 62°·6 F. ; it sets into a butyraceous mass at 20°·3 F. ; it is inodorous, and I think may be substituted in perfumery for oil of ben, which it closely resembles ; it is nearly insoluble in alcohol. It is sweet, and does not appear to produce the same effects as the fruit, at least when taken in small quantity ; in the air it undergoes very little alteration, but when placed in a tube with oxygen, it absorbed that gas very slowly, and became perfectly white and limpid. The oil does not solidify completely under the influence of hyponitrous acid ; it always retains a pasty consistency. It is saponified with difficulty by potash, but soda readily converts it into a white hard soap. Ammonia acts upon it as upon most oils, producing a solid white body, of which the properties will be referred to hereafter.

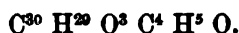
The proportion of oil contained in the nut is 37 per cent. ; in the kernel it amounts to 50 per cent., and the envelope might easily be separated by bolting. The nuts contain 2.25 of nitrogen ; the cake from which the oil had been expressed gave 4.56 per cent. of nitrogen.

By the action of heat this oil is decomposed, furnishing acroleine and different products, amongst which sebacic acid occurs. It is attacked by nitric acid, with evolutions of nitrous fumes and formation of hydrocyanic acid ; the oil furnishes volatile fatty acids, and at last a white acid soluble in hot water, and fusible at 248° F. Analysis of this acid and of its silver salt show that it is suberic acid, $C^{16} H^{14} O^8$.

Saponified by potash, the oil gives a soap, which, when decomposed by muriatic acid furnishes fatty acids, which solidify at ordinary temperatures, and only fuse at about 86° F. By well regulated pressure, a very white solid acid may be separated, which is deposited from alcohol in brilliant spangles ; it fuses at 131° F., and solidifies at 128°·3 F. ; it amounts to 18 or 20 per cent. of the weight of the oil. Its analysis agreed exactly with the formula $C^{30} H^{30} O^4$, which was also confirmed by the analysis of its silver salt. The latter is but slightly soluble in water, but very soluble in boiling alcohol ; it fuses when heated, and burns very readily, without diffusing any odor ; it leaves a residue of metallic silver.

Several substances give rise to an acid presenting a similar composition, but varying either in their point of fusion or in their appearance. Thus, Walter extracted from oil of ben an acid which crystallized in granules, and fused at 125° – 127° F. (*benic acid*.) Hardwick obtained from the oil of *Bassia longifolia* an acid of a waxy aspect, which was deposited from its ethereal solution in granular tubercles, and fused between 131° .9 and 133° .7 F. He represented it as $C^{30} H^{30} O^4$, and named it *bassic acid*. In the Chinese wax, Borck found an acid which fused at 141° .8– 143° .6 F., and separated from alcohol in nacreous lamellæ; to this he gives the name of *stillistearic acid*, and ascribes to it the above composition. Lastly, Heintz, in examining spermaceti, obtained an acid of the same composition (*cetic acid*), which crystallized in nacreous spangles, fusible at 128° .3 F. The acid examined by me having the closest analogy to cetic acid, I shall call it *isocetic acid*.

Isocetic Ether, obtained by the ordinary processes, is inodorous; it fuses by the heat of the hand, and solidifies at 69° .8, remaining perfectly transparent, but acquiring a crystalline texture. The numbers obtained by analysis agree with the formula—



The action of sulphurous acid upon the oil furnished a result which deserves mention, and which will assist in the explanation of the mode of action of this acid upon certain neutral fatty matters. A current of sulphurous acid was passed into the oil, and the whole left standing; at the end of three months a deposit crystallized in granules was found in the oil; this was separated, pressed and purified by alcohol. It is fusible at 136° .4 F., combines with bases to form salts, and is very soluble in alcohol; its composition is that of the solid acid of the oil, but its point of fusion is higher. The sulphurous acid must then become partially converted into sulphuric acid, and the latter will have produced a partial saponification. Acid saponification may therefore take place slowly in the cold, *without coloration*, under the influence of a small quantity of acid; and I need not insist upon the importance of this fact.

When the oil is treated with ordinary sulphuric acid, keeping the temperature at 230° F., the mass becomes black, evolves sul-

phurous acid, and furnishes a black elastic substance, known in the manufactories as *sulphoglyceric acid*. This substance, washed with water, and then distilled with a current of vapor, furnishes fatty acids, which form a crystallized mass.

When the oil is left in contact with ammoniacal alcohol for a month or two, crystals make their appearance on the sides of the vessel; these disappear, and their place is taken by a flocculent substance held in suspension in the alcoholic fluid. The oily stratum gradually diminishes, and at last disappears. The alcohol, when slowly evaporated, deposits a white matter, of which the point of fusion and the composition are not always the same. This result is arrived at more quickly in operating by heat in a closed vessel.

The substance purified by crystallization from alcohol is very white and pearly, and fuses at $152^{\circ}.6$ F. into a colorless transparent fluid. This substance is not acted upon by solution of potash; it is only decomposed by very concentrated potash, when ammonia is evolved, and a soap is formed which is but slightly soluble in water. From this muriatic acid separates a solid white acid. Its analysis led to the formula $\text{C}^{30}\text{H}^{31}\text{O}^2$, which represents the amide derived from isocetic acid, which I call *isocetamide*, $\text{C}^{30}\text{H}^{29}\text{O}^2, \text{NH}^2$.

Besides isocetic acid, the oil contains another liquid acid, which does not solidify at 13° F. It may be obtained by treating with ether the papers which have been used in pressing the mixture of acids, or by saponifying the oil with oxide of lead and treating the soap with ether, which only dissolves the lead salt of the liquid acid. This acid gave the composition of oleic acid.

The lead salt obtained directly by saponification with precipitated oxide of lead, has the composition $2 (\text{C}^{36}\text{H}^{33}\text{O}^5) \text{PbO}, \text{HO}$.

That obtained by precipitation is represented by $\text{C}^{36}\text{H}^{33}\text{O}^5, \text{PbO}$.

It appears from what precedes, that the oil of the purging nut may be usefully employed in the arts, either in perfumery or in the manufacture of soap; and I have no doubt, that if, as is stated, the plant is very abundant in the West Indies, the production of the oil will become highly advantageous to those colonies.—*London Chem. Gaz.*, from *Comptes Rendus*.

ON THE LEAVES OF THE COCA OF PERU (ERYTHROXYLON COCA, LAMARCK).

BY DR. H. A. WEDDELL.*

(Continued from page 38.)

Let us now examine the properties of the Coca, after having glanced at the manner of employing it.

The Peruvian ordinarily keeps his coca in a little bag called *chuspa*, which he carries suspended at his side; and which he places in front whenever he intends to renew his *chique*, which he does at regular intervals, even when travelling. The Indian who prepares himself to *acullicar*, i.e. to chew, in the first place sets himself as perfectly at ease as circumstances permit. If he has a burden, he lays it down; he seats himself, then putting his *chuspa* on his knees, he draws from it one by one the leaves which are to constitute his fresh "quid." The attention which he gives to this operation is worthy of remark. The complaisance with which the Indian buries his hand in the leaves of a well-filled *chuspa*, the regret he seems to experience when the bag is nearly empty, deserve observation; for these little points prove, as I shall have occasion to repeat further on, that to the Indian the use of coca is a real source of enjoyment and not the simple consequence of want.

As the Indian deposits the leaves in his mouth he wets them by turning them over with the tongue, forming them into a sort of little ball, which he places against his cheek as a sailor does his tobacco. This done, he takes from his *chuspa* a little box which generally accompanies the coca, and removes from it a very small quantity of an alkaline paste, called *llipta*, which is the ordinary condiment to the leaf. The *llipta* which the Peruvians, and especially the Bolivians, are in the habit of using, is made of the ashes of the *Quinoa* (*Chenopodium quinoa*) or of those of the common *Cereus*. The ashes of several other plants, however, are used for the same purpose; they are often sold in the markets in the form of little flat cakes. In some parts of America lime is substituted for them.

* Extracted from Dr. Weddell's *Voyage dans le Nord de la Bolivie*. Paris, 1853, 8vo, ch. xxix.

From the constancy with which the Indians employ an alkali with the coca, one might presume that it favors the solution of the active matter of the leaf; but on this head we know nothing positive. Others have said that the *llipta* was intended to neutralize the acid* of the leaf; but it is easy to convince oneself that the coca contains no principle of this nature in appreciable quantity.

The leaves of the *Erythroxylon* approach in shape and size those of tea, but they have never the dentated margin; on the under side, a prominent and curved line on each side of the midrib serves to distinguish them from most other leaves known. When dried well, they are of a very pale green, deeper on the upper than on the under side; their odor is then agreeable and even analogous to that of tea. When, on the contrary, the coca has been dried less perfectly, this agreeable aroma is hardly perceptible, or rather is overpowered by a pungent odor, *sui generis*, recalling the abominal smell exhaled by the breath of the masticators of coca, which is, in fact, the odor in a concentrated state. The *bouquet*, if I may so term it, is very perceptible on tasting the coca, and serves, according to its abundance, in indicating its quality. On the other hand, in a concentrated infusion, and still more so in a decoction, it is a bitterness mixed with something styptic that more particularly strikes the palate.

As to the immediate physiological effects of this infusion, frequently repeated trials enable me to assert that they are in general limited to a slight excitement, succeeded in most cases by some degree of sleeplessness.

The questions relative to the effects resulting from the use of coca are less easily determined; we may begin, nevertheless, by stating that an immense majority of authors, both ancient and modern, who have written on the subject, have agreed in attributing to the coca-leaf thus employed, virtues whose well-ascertained existence would warrant it being placed among the more

* Thus, Dr. Unanue speaking of the beneficial properties of the coca, says: "De la combinacion del alkali de la llipta con el acido de la Coca no resultara una sal neutra, una sal vegetal aperitiva y laxante que coopere en gran parte quando la Coca obra de este modo." Vide *Dissertacion sobre las virtudes de la famosa planta del Peru nombrada Coca*. Lima, 1794.

beneficial products of the vegetable kingdom ;† and such would doubtless remain the admitted opinion, had not a modern traveller completely shaken it, by supporting an opposite view, that is to say, in attributing to coca very pernicious effects, comparable in fact to those brought about by the excessive use of opium.

Such assertions in the presence of reports so opposite as those I have cited; may well cause some astonishment. Individuals are, however, not wanting, who give us to understand, that if this traveller had not trusted too implicitly to the accounts of ill-informed persons, he had erred at least, in too much generalizing exceptional facts. For my part, I may say, that the researches that I have been able to make on the subject, in localities where the coca is the most in use, have shown me that the mastication of the leaf does sometimes produce evil consequences among Europeans who have not accustomed themselves to it from youth; and, in two or three cases, I have thought I could attribute to the abuse of this practice a peculiar aberration of the intellectual faculties indicated by hallucinations. But in the countries which I have visited, on no occasion have I seen the results to reach the point instanced by M. Poeppig.

Let us now examine what are the beneficial properties attributable to coca. Of these the most remarkable is undeniably its reputed power of sustaining the strength in the absence of any other nutriment. The facts on which this opinion rests have been asserted by so many credible persons, that scepticism must be carried very far to throw over it a doubt; it appears to me, however, that opinions may vary according to the interpretation of the same facts.

One of two things is certain, either the coca contains some nutritive principle which directly sustains the strength, or it does

† "Quotquot Peruanam historiam scripserunt, referunt earum regionum incolas admodum delectari quarundam radicum, ramusculorum, aut herbarum gestatoire in ore, ut Orientales suo Betre [*betel*] delectantur: præsertim verò familiarem esse (Petri Ciecxæ testimonio) quandam herbam *Coca* illis dictam, quam à summo mane ad noctem usque perpetuò in ore retinent, tametsi neque cam mandant, neque deglutiant. Percontati cur eam assidue in ore habeant, respondent ejus usu nec famem nec sitim sibi molestam, et vires roburque sibi confirmari."—*Clusii Exoticorum Libri—Aromaticum Historia*, lib. 1, cap. xviii.

not contain it, and therefore simply *deceives* hunger while acting on the system as an excitement.

As to the existence of a nutritive principle in coca, I am far from wishing to deny it; analysis, indeed, shows the existence in the leaf, and especially in its active principle,* of a notable quantity of nitrogen, together with assimilable carbonized products; but the proportion of these substances is so small, compared with the total mass of the leaf, and especially with the quantity of it, that the Indian consumes in a given time, that they can hardly be taken into consideration. Moreover, I can affirm very positively that coca, as it is taken habitually, does *not* satiate hunger. This is a fact of which I have convinced myself by daily experience. The Indians who accompanied me on my journey chewed coca during the whole day; but evening arrived, they filled their stomachs like fasting men, and I am certain I have seen one devour as much food at a single meal as I should have consumed during two days. The Indian of the Cordillera is like the vulture of his mountains; when provisions abound he gorges himself greedily; when they are scarce, his robust nature enables him to content himself with very little. The use of coca assists, it may be, to support the abstinence; but we must have cases far more conclusive than those which I have witnessed, to convince me that it plays a part more important than that which I attribute to it. I will, however, add to what I have before said of the *llipta*, that this alkaline substance may also contribute by its direct influence on the secretions of the stomach, to allay the requirements of that organ.

The action of coca is then, in my opinion, confined to an excitement, but an excitement of a peculiar kind, which I consider as very different from that resulting from the use of most of the ordinary excitants, and especially of alcohol. Brandy gives

* From the sleeplessness induced by an infusion of coca, I at first thought it might contain theine, but the examination which I have made in following the processes recommended by M. Péligot, have negatived this supposition, and the same result has followed the more exact analyses which Professor Frémy has kindly made at my request. There nevertheless exists in coca a peculiar active principle, soluble in alcohol, insoluble in ether, very bitter, but which it has not hitherto been possible to obtain in crystals.

strength, as all know; but who does not know also that the "gift" is but a *loan* made out at the expense of strength reserved for the future? The action of this agent, though powerful, is transient. The stimulus produced by mastication of the leaf of the *Erythroxylon* is, on the contrary, slow and sustained, characters which it owes doubtless in great part to the manner of its employment, since an infusion of coca acts very differently from the leaf taken in the ordinary way. It will be said that tea and coffee, whose effects appear to have more analogy with those of coca, would perhaps produce analogous results if taken in the same manner. I do not believe that such would be the case. Tea and coffee (coffee in particular) act specially on the brain, on which they produce an antisoporific effect, but too well known to those who are not in their habitual use. But coca, while producing a little of this effect, when taken in large doses, as I have often experienced in my own person, does not act perceptibly upon the brain in small doses. To account for the ordinary effects of the leaf, one must then suppose that its action, instead of being localised, as in the case of tea and coffee, is diffused, and bears upon the nervous system generally, producing upon it a sustained stimulus, well suited to impart to those who are under its influence that support which has been erroneously attributed to peculiar nutritive properties.

Finally, I think that in the fidelity of the Indian to the use of coca, as with some smokers and their pipes, much is due to habit; and it is, I think, essential not to lose sight of the fact, that the force of habit must have an influence all the more powerful, since the habit in question is almost the only one he retains of past times, and that now, as then, he attaches to the use of the coca-leaf superstitious ideas, which, to his imagination, must at least treble the greatness of the benefits he derives from it. Lastly, that in the mastication of coca he finds the sole distraction that breaks the incomparable monotony of his existence.—
London Pharm. Jour. Nov. 1854.

ON GENUINE THEOBROMINE.

BY DR. E. KELLER.

When theobromine is carefully heated between two watch glasses, it forms a brilliant white sublimate, and leaves a small quantity of carbon behind. The substance thus sublimed may be re-sublimed without further alteration. The hydrochloric acid solution of this sublimate gave with chloride of platinum splendid golden-yellow crystals. An analysis of the sublimate, and a determination of the atomic weight, led to the formula $C^{14} H^3 N^4 O^4$.

The analyses of theobromine already published appear to have been made with the commercial article. This would account for the assertion, that it does not volatilize without decomposition. All the specimens of theobromine obtained in the way of trade, showed this carbonization more or less; and sometimes the sublimate was colored red, arising probably from the decomposition of some cinchotannic acid present.

The taste of sublimed theobromine is decidedly bitter, and different from that of the unsublimed.

This property of sublimation without decomposition, brings theobromine a step nearer to caffeine.—*London Chem. Gaz.*, from *Ann. der Chem. und Pharm.*

ON THE STEAROPTEN OF THE OIL OF THE PTYCHOTIS AJOWAN,
AN UMBELLIFEROUS PLANT FROM THE EAST INDIES.

BY JOHN STENHOUSE, LL.D, F.R.S.

A few months ago I obtained a quantity of this stearopten from the late Dr. Stocks, whose recent premature death has been such a loss both to science and to the medical service of the East India Company.

Dr. Stocks states that "this stearopten is not found in the bazaars of Scinde, but in the druggists' shops at Poonah and other large towns in the Deccan.

"It is called Ajowan Ka Phul (sublimed Ajowan), and is prepared from the grains or pericarps of the *Ptychotis Ajowan*, an umbelliferous plant, well known in India for its aromatic and carminative properties. It is made at Oojein and elsewhere, in Central India, during the cold season, and is said to form spon-

taneously on the surface of the distilled water of the Ajowan grains."

The stearopten forms very transparent and symmetrical crystals, some of which are more than a quarter of an inch long.

The crystals of the stearopten are heavier than water; their odor is very peculiar and pungent, somewhat resembling the oils of thyme and marjorum. Their melting point is 42° C., and they can be distilled over in a current of carbonic acid gas. After having been dried in vacuo they were analyzed in the usual way with chromate of lead.

I. 0.1618 grammes of substance gave 0.411 grammes of carbonic acid and 0.1372 grammes of water.

II. 0.22 grammes of substance gave 0.5555 grammes of carbonic acid and 0.1 grammes of water.

	Calculated.			Found.	
$C_{44} =$	264	69.84	. . .	69.49	68.86
$H_{34} =$	34	8.99	. . .	9.45	9.57
$O_{10} =$	80	21.17	. . .		
	<hr/>	<hr/>			
	378	100.00			

From these results, therefore, it follows that the empirical formula of the stearopten is $C_{44} H_{34} O_{10}$.

The stearopten is a perfectly neutral body, and neither combines with alkalies nor acids, but by boiling with strong acids or alkalies it is decomposed. The products of the decomposition have not yet been examined.

When a stream of chlorine gas was passed through the melted stearopten, it was rapidly absorbed, and so much heat was evolved that the vessel containing the stearopten required to be cooled.

The chlorine compound has a deep yellow color, and crystallizes in beautiful needles. The original stearopten is exceedingly soluble, both in alcohol and ether, but the chlorine compound is much less soluble in cold alcohol and ether, but tolerably soluble in hot alcohol. After having been several times crystallized out of alcohol, and submitted to pressure between folds of blotting-paper, it is rendered perfectly pure.

After having been dried in vacuo :

0.2485 grammes of substance gave 0.4185 grammes of chloride of silver.

0.423 grammes of substance gave 0.634 grammes of carbonic acid, and 0.154 grammes of water.

	Calculated.			Found.
$C_{44} =$	264	40.37	. . .	40.265
$H_{26} =$	26	3.97	. . .	3.988
$Cl_8 =$	284	43.43	. . .	43.094
$O_{10} =$	80	12.23	. . .	
	<hr/>	<hr/>		
	654	100.00		

The formula of the chlorine compound is, therefore, $C_{44} H_{26} Cl_8 O_{10}$.

If the action of the chlorine on the stearopten be continued longer than is necessary to produce the crystalline compound (which is usually formed in from two to three hours), it begins to be decomposed, being converted into an uncrystallizable resin.

Bromine acts readily on the stearopten, but the combination which it forms with it is not crystallizable.

When the stearopten was digested with nitric acid it temporarily assumed a deep green color, and was changed into a deep yellow resinous substance, which was but slowly acted upon by nitric acid; but by long-continued digestion in nitric acid colorless crystals were produced, which were not oxalic acid; but the quantity obtained was too small to enable me to submit them to further examination.

Hydrochloric acid has no action upon the stearopten.

The stearopten cannot be distilled over anhydrous phosphoric acid unchanged, but is converted into a green substance soluble in alcohol, and precipitated from this solution by water in the form of a dark green thick liquid, having an acid reaction, and not crystallizable either in the free state or combined with potash.—*Pharm. Jour.*, Dec. 1854.

ACONITIC ACID IN DELPHINIUM CONSOLIDA.

By W. WICK.

Aconitic acid has been found in *Aconitum napellus*, *A. stearkianum*, *Equisetum fluviatile*, and *E. limosum* (and at first called

equisetic acid). Berzelius pointed out that the relation between aconitic and citric acids is the same as that between fumaric and malic acids, Robiquet having found that by dry distillation citric acid yielded aconitic acid.

From the close relation between aconitum and delphinium, and from the opinion that a morphological resemblance between plants indicates similar productive agency, the author considered it probable that aconitic acid exists in the latter, and the result of his examination proved that his conjecture was well founded. The herbaceous part of the plant, after flowering, was submitted to examination.

The expressed juice was boiled for about half an hour to separate albumen and chlorophyle, strained, oxalic acid added to separate lime, the filtrate treated with acetate of lead; the lead salt decomposed by sulphuretted hydrogen, and these two operations repeated until a tolerably colorless liquid was obtained. It is extremely difficult to separate the coloring substances.

This liquid, evaporated to dryness, was treated with ether, when the aconitic acid was obtained on evaporation in the characteristic form of warty masses of crystals. The crystals were readily soluble in alcohol and water. When heated in a tube there distilled off drops of liquid which crystallized (itaconic acid) and a voluminous coal remained.

The analysis of the silver salt gave 69.57 per cent. oxide of silver. Calculation gives 69.21 per cent.—*Pharm. Jour. from Annalen der Chemie und Pharmacie*, April, 1854.

INFLUENCE OF THE POISON OF THE NORTHERN RATTLESNAKE —(CROTALUS DURISSUS)—ON PLANTS.

By J. H. SALISBURY, M. D.

It is a curious and well known fact, that some of our most deadly poisons are animal secretions, and that the very animals—the very tissues which secrete these powerful proximate organic principles, are as susceptible to their deleterious influence, when introduced into their circulation, as the tissues of the most harmless animal would be under similar circumstances. It is also well known that many vegetable products are highly poi-

sonous to animals. But the influence of animal and vegetable poisons upon plants, has—although a subject scarcely less interesting in a physiological point of view—excited but little attention. The simplicity of the plant's structure renders the field one of peculiar interest, in the way of studying the general action of medicinal agents and poisons upon organized tissues.

On the 18th of June, 1851, a large female rattlesnake, which had been caged in the N. Y. State Cabinet of Natural History, for about a year, without food, died. On dissection, its stomach and intestinal canal were found entirely empty. The sac into which the poison is emptied was laid open, and the virulent matter (of which there was little), carefully removed and placed in a porcelain capsule. About fifteen minutes after its removal, four young shoots of the lilac, *Syringa vulgaris*, a small horse-chesnut of one year's growth—*Aesculus hippocastanum*, a corn plant—*Zea Maize*, a sunflower plant—*Helianthus annuus*, and a wild cucumber vine, were severally vaccinated with it. The vaccination was performed by dipping the point of a pen-knife into the poisonous matter and then inserting it into the plant just beneath the inner bark. No visible effect, in either case, of the influence of the poison was perceptible till about sixty hours after it had been inserted. Soon after this the leaves above the wound, in each case, began to wilt. The bark in the vicinity of the incision exhibited scarcely a perceptible change; in fact it would have been difficult to have found the points, if they had not been marked when the poison was inserted. Ninety-six hours after the operation, nearly all the leaf-blades, in each of the plants, above the wounded part were wilted, and apparently quite dead. On the fifth day the petioles and bark above the incisions began to lose their freshness; and on the sixth they were considerably withered. On the seventh day they appeared about as they did on the sixth. On the tenth they began to show slight signs of recovery. On the fifteenth, new, but sickly appearing leaves began to show themselves on the lilacs, and the other plants began to show slight signs of recovery in the same way. Neither of the plants were entirely deprived of life.

It was interesting to mark the progressive influence of the poison. The first indication of the derangement of the healthy

functions of the plants was observed in the leaves: these began to wilt and die at their edges and apices; and this death gradually and uniformly advanced on all sides towards the midrib and petiole, till the whole, or nearly the entire leaf-blade was destroyed.

It is an interesting fact in physiology, that the plants first exhibited signs of death in the leaves; and still more interesting, that this death commenced first in the leaves on the side of the plant in which the poison was inserted.*

The facts materially deducible from these experiments are:—

1. That the effects of the poison of the rattlesnake upon plants and animals, when introduced into the circulation by a wound, are similar.†

2. That it requires a much longer time for it to affect the plant than the animal.‡

3. That the effects were invariably exhibited on the parts above the wound, and in no case effected the leaves below it.§

4. That it invariably affected first the leaves on the side of the plant in which the incision was made.

5. That its influences were first rendered visible on the edges and apices of the leaf-blades.—*N. Y. Jour. of Med.*, Nov., 1854.

ON AN EASY METHOD OF PREPARING ATROPINE.

By W. T. LUXTON, M. R. C. S., L. A. C.,

Late House-Surgeon to King's College Hospital, London.

This alkaloid, which is of such immense value to the ophthalmic surgeon, and which, I think, will become of almost equal

* This shows a less perfect system of anastomosing vessels than exists in the animal.

† It is stated on good authority, that the poison of the snake can be taken into the stomach of the animal with impunity; its dangerous effects being only exhibited when introduced into the circulation by a wound. It would be interesting to note its influence on the animal when applied externally, to the skin, to see whether its deadly effects would be modified by the absorbents.

‡ It should be stated, in order to show that animals were readily affected by the poison of the snake, that a short time previous to its death, a rat bitten by it died in two hours.

§ This was probably owing to the small quantity of poison inserted in each case.

importance to the general physician, is generally, I believe, procured from the *root* of the *Atropa belladonna* by digestion in alcohol, so as to form a tincture, to which lime is added to precipitate the atropine, then sulphuric acid is dropped in in slight excess, and the sulphate of lime so formed separated by filtration. A portion of the filtered fluid is then distilled off, water added, and the rest of the spirit driven off by evaporation. Carbonate of potash is now added to precipitate the alkaloid, which is to be collected, dried, and again dissolved in alcohol; water is again added, and it is lastly evaporated and crystallized. 1000 parts of root are stated to yield three of the alkaloid (*vide Brandes' Chemistry.*)

Now as this is at the best a very tedious process, as well as expensive on account of the time and spirit which are consumed, perhaps I may be pardoned for offering a more simple but equally efficacious one to the notice of this Society. It nearly resembles the original method of M. Brandes, the discoverer of the substance in question, but differs from it in the circumstance that he precipitated the atropine with liquor potassæ, I with liquor ammoniæ.

A pound of the dry leaves of the belladonna are to be boiled in distilled water sufficient to cover them, for two hours, and the decoction strained off through a coarse cloth into a large precipitating jar. The leaves are again boiled in a second water and the decoctions mixed, to which two drachms of strong sulphuric acid are now added; the vegetable albumen is precipitated, and the clear liquor is drawn off with a syphon to a filter. A clear sherry-colored solution comes through, which is either decomposed by passing gaseous ammonia through it, or by suspending in it a lump of sesquicarbonate of ammonia. In either case, the color becomes changed to black, and crystals of atropine are slowly formed. At the expiration of a day or so, the supernatant liquor may be drawn off with a syphon, and the crystals thrown on a filter to dry.

To decolorise them, about an ounce of spirit of ammonia may be poured on the filter, which washes away most of the coloring matter, leaving the crystals *moderately* white.

By this process I have generally obtained about forty grains from a pound (avoirdupois) of leaves, which gives 5½ grs. to 1000 of plant, instead of 8 to 1000.

I have thus endeavored to describe what seems to me an easy mode of obtaining an agent by which I have been fortunate enough to cure several cases of tic-doloureux (details of which may be forwarded if desired ;) for which purpose I dissolve an equivalent of atropine in dilute nitric acid, and paint the face at the affected spot with it, until the pain is subdued. This usually occurs in about three to five minutes. The relief experienced is in some cases only temporary, and requires a second and even a third or fourth application, but in many it has proved permanent.

I do not intend for a moment to pretend that it will cure those cases which owe their origin to intra-cranial causes ; but in those which are produced by exposure to vicissitudes of temperature and other eccentric causes, I have no reason to doubt its superior efficacy over every other known agent. The nitrate of atropine not being crystallizable, the solution may be made of any strength. The following answers very well :—Add two grains of atropine to one minim of strong acid, sp. gr. 1.5, and to this add one drachm of distilled water.

One point which I think deserving of notice in the above process is, that as the caustic alkalies convert atropine into ammonia, the volatile alkali is far preferable as a precipitating agent.—*Trans. Pharm. Society, in London Pharm. Jour.* 1855.

Sutton Benger, Wilts, Nov. 10, 1854.

ON THE BARK OF GOMPHOSIA CHLORANTHA, WEDD., OCCUR-
ING MIXED WITH QUILLED CALISAYA BARK.

By JOHN ELIOT HOWARD, Esq.

In continuation of the series of barks which I have deposited in the Museum in the Pharmaceutical Society, I now send a specimen recently obtained in commerce of the bark of *Gomphosia chlorantha*, of Weddell.

This tree, according to Weddell,* “characterizes, up to a certain point, the vegetation of the localities which it inhabits. Its lare and silvery trunk, which in general surpasses in height (without ramifications) all the rest of the forest, and its top, in

* *Histoire Naturelle des Quinquinas*, p. 97.

the form of a chandelier, attract the attention of the traveller at a distance." "It grows abundantly in Carabaya, at the same height as *Cinchona Calisaya*," and presents so deceptive a similarity to that valuable tree in the general appearance of its bark, that a considerable quantity mixed with *Calisaya*, recently passed in the London market as *Calisaya Quill of a superior quality*, and obtained a corresponding price.

The bark of *Gomphosia chlorantha* does not contain a particle of any alkaloid, but yields a notable quantity of essential oil possessing the peculiar fragrance of the bark in a concentrated form.

I first identified this bark with a specimen which I had received from Dr. Weddell, and which he had collected himself. I also transmitted to this distinguished naturalist a portion of the bark recently imported, which he recognized as corresponding with his own specimens. Its most distinctive peculiarity is shown by the microscope, a transverse section disclosing a peculiar fasciculate disposition of the cortical fibres, and some vessels gorged with a ruby-colored juice. The tree, though botanically very nearly allied to the *Cinchonæ*, thus differs wholly in its properties from that genus, and is calculated to deceive by its resemblance to a more valuable product of the forests of New Granada and of Peru.—*Lond. Pharm. Jour. Jan. 1855.*

ON THE MEDICINAL PREPARATIONS OF GLYCERIN.

By CAP AND GAROT.*

The authors have made many experiments about the solubility of certain medicinal substances in glycerin, from which they derive great confidence regarding the value of such solutions in external applications. They even believe it to be a good vehicle for some preparations intended for internal use, provided, however, that the harmlessness of glycerin be demonstrated, if taken internally. The advantages of using glycerin as a solvent and excipient are manifold. Its solvent power very often equals that of water or alcohol, and even is sometimes greater; it can be mixed with alcoholic and aqueous solutions, it is not subject to

* Translated and abridged from the *Journal de Pharmacie*, for August, 1854, by J. M. Maisch.

changes, particularly it does not become rancid; its preparations may be used like any oily embrocation; they will be readily absorbed by the skin, which afterwards may be washed with a little water; wounds after they have been dressed with such a preparation, may easily be washed out with warm and even cold water; chirurgical instruments can be cleaned with much less difficulty.

The glycerin that has been used by the authors is of 28° aerometer, and contains about 12 per cent. of water; for the preparations therewith they propose the name of glyceroles. Their first object was to ascertain the degree of solubility in glycerin of the different medicinal preparations, the results of which, as compared with their solubility in water, alcohol and oil, we give in the following table, — signifying insoluble, 0 decomposition.

Name of bodies.	Glycerin.	Soluble in parts of		Oil.
		Alcohol.	Water.	
Sulphur,	2000	—	—	—
Sulphuret of potassium,	10	—	2	—
“ calcium,	10	—	500	—
Iodine,	100	20	7000	110
Iodide of sulphur,	60	0	—	82
“ potassium,	3	5.55	1.33	—
Binioidide of mercury,	340	200	—	—
Proto-iodide,	—	—	—	—
Corrosive sublimate,	14	2.50	17	—
Calomel,	—	—	—	—
Quinine,	200	6	—	62
Sulphate of quinia,	48	45	740	—
Tannin,	6	0.50	1	—
Tannate of quinia,	130	52	—	1200
Morphine,	—	50	—	—
Muriate of morphia,	19	40	20	800
Strychnia,	300	120	6667	200
Nitrate of strychnia,	26	70	50	100
Veratria,	96	1.50	1000	100
Brucia,	70	1.50	850	120
Atropia,	50	2	350	35
Tartar emetic,	30	—	14	—

The solutions of the sulphurets must be kept excluded from the air; on addition of water only, they exhale the smell of sulphuretted hydrogen. The solutions of iodine and iodide of sulphur have a smell resembling that of saffron. An addition of water precipitates some iodide of mercury.

When heated glycerin dissolves 1-40th of sulphate of quinine,

forming on cooling a transparent gelatinous mass. With 6 parts of glycerin, the mass deposits a part of the sulphate in warty crystals, which after the whole being rubbed in a mortar, form a kind of cerate.

By the aid of heat tannin may be dissolved in 4 parts of glycerin; the solution is thick and cannot be filtered through paper.

One part of muriate of morphia may be made into a sort of cerate with 5 parts of glycerin.

Sugar is in glycerin soluble only to 1-10th part, on account, as it seems, of the water contained in it.

5 parts of glycerin and 1 of gum arabic form a transparent mucilage; 1 part of glycerin to 3 parts of powdered gum arabic unite to a thick mass, which, when spread, adheres well and is very flexible; a few drops of glycerin added to the court plaster mass makes it pliant and prevents the spread plaster from cracking.

Glycerin mixed with an equal part of tar and strained, forms a tar glycerole of a dark amber color, strong smell, and oily consistency, serviceable, perhaps, in certain diseases of the skin.

Equal parts of gum ammoniac and glycerin unite to the consistency of plaster, 1 part of the first to 7 of the latter to a cream-like glycerole, which may be strained through linen, and after months standing does not separate.

Camphor is soluble only in 400 parts of glycerin, but more after it has been rubbed up with alcohol or ether.

Starch and glycerin in equal quantities form a sort of pomade, which may be mixed with salts, alkaloids, soaps, extracts, tar, &c. The same results form 1 part of powdered althæa to 3 parts of glycerin.

The authors believe that fats extracted from fresh herbs little more than chlorophyll, wax, aromatics, and coloring matter, whilst glycerin would dissolve gum, sugar, tannin, extractive matter, watery juices, alkaloids and the aroma. It also dissolves the aqueous and alcoholic extracts in considerable quantity. 1 part of it added to fifty parts of collodion impart to this preparation flexibility and elasticity.

The general results of these experiments are :—

1. The solvent power of glycerin lies between that of water and alcohol.

2. Substances are in general the more soluble in glycerine, the more they are so in alcohol, with some exceptions, however.

3. In most cases alcohol is a better solvent than glycerin, nitrate of strychnia excepted.

4. Glycerin is a soft, mild solvent, deserving the preference to alcohol in many cases of external application.

5. Independent of the water it contains, glycerin of itself has solvent powers, as there are some substances soluble in it that are insoluble in water, and *anhydrous* glycerin dissolves iodide of potassium as well as that of 28°.

ON COPALCHE BARK.

By JOHN ELIOT HOWARD, Esq.

I beg to present to the Pharmaceutical Society a specimen of Copalche Bark, the produce, according to Pereira, of *Croton Pseudo-China*, and described by him in his *Elements of Materia Medica*, vol. ii., pt. 1, p. 1283. It is part of a recent importation of about sixty bales, brought from Puntas Arenas, in the gulf of Nicoya. From the situation of this port, it is probable that the bark is the produce of some part of Costa Rica. The specimen is evidently identical with Pereira's specimen of *Quilled Copalche*, which is deposited in the Museum of the Society. The odor in burning is that of Cascarilla, and in both these specimens the appearance of the singularly indented, resinous-looking derm where denuded (especially when observed with a magnifying glass,) is a highly characteristic feature of the species. It appears, as Pereira indicates, to be the sort figured by Goebel and Kunze,* and ascribed (owing to a suggestion of Humboldt) to the *Croton suberosum*. This is more probably the origin of Pereira's *Corky Copalche bark*, which was described by my friend Dr. Stark, in 1849, from specimens which I had the pleasure of forwarding to him. This latter kind is corky in the extreme, which is not the case with the *Quilled Copalche* now before us.

* Goebel and Kunze *Pharmaceut. Waarenk.*

The feature which is most interesting in the chemical examination of the bark, is the presence of a bitter alkaloid, soluble in ether, and precipitable as a white hydrate, from its solution in acid; of this I have assured myself by two experiments, guarding very especially against the possibility of mistake from any source. The bark contains, in addition, a large percentage (6 per cent.) of fragrant wax, as well as some fatty matter. Brandes obtained from the *Croton Tiglium* a crystallizable substance which he called *Crotonin*, and thought to be a peculiar alkaloid, but this was brought into question by Weppen, who found only a magnesian soap with an alkaline reaction.† The alkaloid which I have obtained, *yields a deep green color with chlorine and ammonia*. The proportion in the bark is about 0.05 per 100 parts. The taste is not unlike that of quinine; but it appears to differ from this alkaloid in being (apparently) crystalline, and in not affording under the microscope the appearance which Herapath has so well indicated as *the test* for quinine,—neither does it answer to quinidine. It deserves further examination.—*London. Pharm. Jour. Jan. 1855.*

MANUFACTURE OF PRUSSIATE OF POTASH.

Mr. Watson, of Leeds, has lately suggested some improvements in apparatus for the manufacture of prussiate of potash. These improvements consist in so constructing, arranging, and combining apparatus with the iron pots, in which the animal matter is combined with the fused potash, that such animal matter may be introduced into the pots through a tube or passage communicating with the lower part of the pots, and in connecting with the pots another and smaller vessel, in such manner as to be heated by the same fire, for the purpose of fusing the potash previous to introducing it into the pots, and having this smaller vessel so connected with the pots, that the fused potash can be conveniently admitted from the smaller into the larger vessel; or such smaller vessel so placed in connexion with the larger vessel, that it may be heated by the same fire, and moveable in such manner that the fused potash may be transferred out of it into the larger vessel. Also, in connecting a pipe or tube with such pots or

† Pereira, *Elem. of Mat. of Med.*, ed. 3., vol. ii., part 1, p. 1274.

vessels, in which the animal matter and potash are mixed, to convey the gases evolved during the operation into suitable condensing and other apparatus, by means of exhausting apparatus, with valves so constructed, that when these gases cease to be evolved, the communication will be shut off between the vessels and exhausting apparatus.—*Annals of Pharmacy*, Dec. 1854.

ON THE SO-CALLED OIL OF CINNAMON LEAF FROM CEYLON.

By JOHN STENHOUSE, LL. D., F. R. S.

For the last ten or twelve years, considerable quantities of cinnamon leaf oil have been imported from Ceylon into Great Britain. The cinnamon leaf oil of commerce is of two qualities, one of which is adulterated with a considerable quantity of a fixed fatty oil, but the other, which sells at a much higher price, consists wholly of essential oil.

Little is known with certainty of the origin of this oil. Dr. Pereira, in the last edition of his *Materia Medica*, page 1308, states: "That he was informed by a gentleman on whose estate in Ceylon this oil is obtained, that it is procured by macerating the leaves of the cinnamon-tree in salt water, and afterwards submitting to distillation."

The quantity of cinnamon leaf oil on which I operated, was kindly given me by Messrs. Quincy and Son, Billiter Street, City. It had been in their possession from two to three years.

Oil of cinnamon leaf, both in its appearance and properties, very closely resembles the oils of cloves and pimento. It has a brownish color, and a specific gravity of 1.053. Its smell is aromatic and penetrating. Its taste is exceedingly pungent. It has an acid reaction, and when treated with solutions of potash or ammonia, it solidifies, forming a butyraceous crystalline magma. Like clove and pimento oil, it is essentially a mixture of eugenic acid and a neutral hydro-carbon, having the formula $C_{20}H_{16}$. Cinnamon leaf oil is remarkable, however, for containing a small quantity of benzoic acid.

When the crude oil was distilled, a colorless oil came over, while the residue in the retort became gradually darker. The last portions of the oil which passed over, on being set aside for some time, deposited crystals which had all the appearance and

properties of benzoic acid. Their quantity was, however, so very small, that they could not be subjected to analysis. I at first suspected these crystals to be cinnamic acid, but I soon found this was not the case, for on treating them with a hot solution of hypochlorite of lime, they did not give the very characteristic reaction of cinnamic acid, namely, the production of that singular chlorinated oil which is always produced when cinnamic acid is treated in this way. That these crystals were really benzoic acid, was ascertained as follows:—When the last portions of the oil which had come over, together with the residue remaining in the retort were digested with strong nitric acid, along with much oxalic acid, a small quantity of another kind of crystals were obtained, which in appearance and properties agreed perfectly with nitro-benzoic acid. They were carefully purified and subjected to analysis.

0.1125 grammes gave 0.2095 grammes of carbonic acid, and 0.0305 grammes of water.

The calculation for nitro-benzoic acid ($C_{14}H_5(NO_3)_2O_4$) requires—

	Theory.	Found.
$C_{14} = 84$	50.29	50.79
$H_5 = 5$	3.00	3.91
$N = 14$	8.38	—
$O_8 = 64$	38.33	—
	<hr/>	
	167	100.00

Of the silver salt of this acid, 0.12 grammes gave 0.046 grammes of silver, corresponding to 38.33 per cent.; theory requires 38.32.

The first portions of the colorless oil which distilled over were again rectified, when the boiling point was by no means constant, though the greater portion of the oil came over at a temperature approaching the boiling point of eugenic acid.

The oil was treated with an excess of potash, and the hydrocarbon which did not combine with the alkali, was drawn off by a pipette. It was next treated with fused potash, then with chloride of calcium, and lastly rectified over potassium. In this way a colorless, highly refractive liquid was obtained, the greater portion of which distilled over between 160° and 165° C. Its

specific gravity was 0.862, and its smell closely resembling that of cymene. The results of its analysis agree exactly with the formula $C_{20}H_{16}$.

	Theory.		Found.
$C_{20} = 120$	- - - 88.24	- - -	88.14
$H_{16} = 16$	- - - 11.76	- - -	11.68
	<hr/>	<hr/>	<hr/>
	136	100.00	99.82

The portion of the oil which dissolved in potash lye (the eugenate of potash) was heated for a considerable time with agitation, in order to drive off the last portions of the hydrocarbon which might be adhering to it.

It was next saturated with sulphuric acid and the liberated eugenic acid still further purified. It agreed perfectly in its characters with those ascribed to eugenic acid by the Chemists, Bonastre, Ettling, and Boeckmann, who have examined eugenic acid. Its boiling point was found to be $242^{\circ}C.$, and its specific gravity 1.076.

The results of its analysis agreed very closely with those of former experimenters.

I. 0.3290 grms. gave 0.8715 grms. of carbonic acid, and 0.2135 grms. of water.

II. 0.2645 grms. gave 0.6895 grms. of carbonic acid, and 0.1765 grms. of water.

	Theory.		Found.
$C_{24} = 144$	- - - 72.86	- - -	72.24 - - - 72.02
$H_{16} = 15$	- - - 7.54	- - -	7.21 - - - 7.41
$O_6 = 40$	- - - 20.10	- - -	20.55 - - - 20.57
	<hr/>	<hr/>	<hr/>
	199	100.00	100.00 100.00

Lond. Pharm. Jour. Jan. 1855.

ON THE IDENTITY OF PEUCEDANINE WITH IMPERATORINE.

By R. WAGNER.

The author prepared imperatorine according to Wackenroder's process, by the extraction of the root of *Imperatoria Ostruthium* with ether. After the volatilization of the ether, the imperatorine separates. It is rendered purer by recrystallization from ether and cold alcohol, in which the fatty oil is only slightly

soluble, but it still retains a burning taste. The author therefore boiled it with thick milk of lime, when a lime-compound is produced, which forms caseous flakes; this is decomposed by acetic acid, and the emperorine, which is precipitated in brown flakes, is purified by recrystallization from cold alcohol. It is then perfectly tasteless.

The author afterwards gives the following process of his own for the preparation of emperorine, by which a greater proportion is obtained. In this way he prepares emperorine both from the root of *Imperatoria Ostruthium* and from *Peucedanum officinale*. For this, 1 kilogram. of finely-cut air-dried root is extracted, in a displacement apparatus, with 3 litres of alcohol of spec. grav. 0.876, at the ordinary temperature. Through the extracted root 1 more litre of alcohol is then passed; and this is followed by a litre of water, so as completely to remove the alcohol. The extracts are mixed and evaporated on the water-bath, or in a retort, at a temperature of about 140° F., until about 1 litre of fluid remains. The fluid, when left to stand, separates into two strata,—a thicker, pale brown, watery one at the bottom, which has a sweet and aromatic taste; and a superior resinous one, of a brown color. The latter is separated from the watery stratum, and placed in a broad porcelain saucer. In a few days it becomes converted into a granular crystalline mass, which is pressed between blotting-paper to remove the fatty oil, which has the greatest affinity to linseed oil, acquires a yellow color with potash, at the same time evolving the characteristic odor of linseed-oil. The granular mass thus obtained is purified by treatment with milk of lime and recrystallization from cold alcohol. In this process only a small quantity of the fatty oil is dissolved; this being a good solvent for emperorine, produces a loss.

The watery fluid contains besides a great deal of grape-sugar, a small quantity of a nitrogenous body, which when heated with potash evolves an odor like that of coniine.

The author has compared the product prepared by him with a sample sent to him by Prof. Wackenroder; the differences which occur in the properties attributed to peucedanine and emperorine arise from adherent impurities. The pure substance is tasteless. Prof. Wackenroder has informed the author that im-

peratorine can only be prepared from old roots of *Imperatoria*; and this the author has found to be perfectly correct. In operating upon strong-smelling fresh roots, the author never obtained anything but a sticky mass, without any trace of crystallization, and it was only by employing old roots that he procured crystallized imperatorine. This circumstance seems to indicate that that ethereal and fatty oils contained in such abundance in the fresh roots assist in the formation of the crystallized imperatorine. The analysis of imperatorine gave,—

Carbon	70.06	70.21	24	70.50
Hydrogen	6.19	6.48	12	5.89
Oxygen	—	—	6	23.52

Peucedanine is resolved, by treatment with alcoholic solution of potash, into angelic acid and oreoseline.—*Chem. Gaz. Nov.* 1, 1854., from *Jour. für Prakt. Chem.* lxii. p. 275.,

ON CHARCOAL AS A DISINFECTANT.

Being a Letter to the Editor of the "Times," as published in that Journal on the 22d November, 1854.

By DR. JOHN STENHOUSE, F.R.S.

Lecturer on Chemistry at St. Bartholomew's Hospital, London.

The great efficacy of wood and animal charcoal in absorbing effluvia and the greater number of gases and vapors, has long been known.

Charcoal powder has also, during many centuries, been advantageously employed as a filter for putrid water, the object in view being to deprive the water of numerous organic impurities diffused through it, which exert injurious effects on the animal economy.

It is certainly somewhat remarkable, that the very obvious application of a perfectly similar operation to the still rarer fluid in which we live—namely, the air, which not frequently contains even more noxious organic impurities floating in it than those present in water, should have, up till February last, been so unaccountably overlooked.

Charcoal not only absorbs effluvia and gaseous bodies, but, especially when in contact with atmospheric air, rapidly oxidizes

and destroys many of the easily alterable ones, by resolving them into the simplest combinations they are capable of forming, which are chiefly water and carbonic acid.

It is on this oxidising property of charcoal as well as on its absorbent power that its efficacy as a deodorizing and disinfecting agent chiefly depends.

Effluvia and miasmata are usually regarded as highly organized, nitrogenous, easily alterable bodies. When these are absorbed by charcoal, they come in contact with highly condensed oxygen gas, which exists within the pores of all charcoal which has been exposed to the air, even for a few minutes; in this way they are oxidized and destroyed. My attention has been specially directed for nearly a twelvemonth to the deodorizing and disinfecting properties of charcoal, and I have made an immense number of experiments on this subject.

On the 22d of February last I brought the subject before the Society of Arts, and on that occasion exhibited a specimen of a charcoal respirator, and the mode of employing it. I likewise dwelt at some length on the utility of charcoal powder as a means of preventing the escape of noxious effluvia from churchyards, and from dead bodies on board ship and in other situations.

On the 9th of June last I also, in a letter to the Society of Arts, proposed to employ charcoal ventilators, consisting of a thin layer of charcoal enclosed between two sheets of wire gauze, to purify the foul air which is apt to accumulate in water closets, in the close wards of hospitals, and in the impure atmospheres of many of the back courts and mews-lanes of large cities, all the impurities being absorbed and retained by the charcoal, while a current of pure air alone is admitted into the neighboring apartments.

In this way pure air is obtained from exceedingly impure sources. Such an arrangement as this, carried out on a pretty large scale, would be especially useful to persons necessitated to live in pestiferous districts within the tropics, where the miasmata of ague, yellow fever, and other diseases are prevalent.

The proper amount of air required by houses in such situations might be admitted through sheets of wire gauze or coarse canvas, containing a thin layer of coarse charcoal powder.

Under such circumstances also pillows stuffed with powdered

charcoal, and bed coverlets having the same material quilted into them, could not fail to prove highly beneficial.

A tolerably thick charcoal ventilator, such as I have just described, could be very advantageously applied to the gully-holes of our common sewers, and to the sinks in private dwellings, the foul water in both cases being carried into the drain by means of tolerably wide syphon pipes, retaining always about a couple of inches of water.

Such an arrangement would effectually prevent the escape of any effluvia, would be easy of construction, and not likely to get soon out of order.

The charcoal respirators to which I have already referred, and to which I should wish to draw especial attention, are of three kinds.

The first form of the respirators is constructed for the mouth alone, and does not differ in appearance from an ordinary respirator, but is only half its weight, and about one-fifth of its price.

The air is made to pass through a quarter of an inch of coarsely powdered charcoal, retained in its place by two sheets of silvered wire gauze covered over with thin woollen cloth, by which means its temperature is greatly increased. This charcoal respirator possesses several advantages over the respirators ordinarily in use :—

1st. Where the breath is at all fetid, which is usually the case in diseases of the chest, under many forms of dyspepsia, &c., the disagreeable effluvia are absorbed by the charcoal, so that comparatively pure air alone is inspired. This, I think, may occasionally exert a beneficial influence on diseases of the throat and lungs.

2d. The charcoal respirator for the mouth alone will certainly prove highly useful in poisonous atmospheres, where miasmata abound, if the simple precaution is only observed of inspiring the air by the mouth and expiring it by the nostrils.

The second form of respirator is ori-nasal—that is, embracing both the mouth and the nose. It is only very slightly larger than the one already described, and does not cover the nose as the ordinary ori-nasal respirator does, but merely touches its lower extremity, to which it is adapted by means of a piece of flexible metal covered with soft leather. When this respirator is

worn, no air enters the lungs without first passing through the charcoal, and any effluvia or miasmata contained in the atmosphere are absorbed and oxidized by the charcoal. This form of the respirator, therefore, is peculiarly adapted for protecting the wearer against fevers and other infectious diseases.

The third form of the respirator is also ori-nasal, but is much larger, and therefore more cumbersome than the preceding variety. It is intended chiefly for use in chemical works, common sewers, &c., to protect the workmen from the noxious effects of the deleterious gases to which they are frequently exposed.

I think it but justice to myself to state, that I have no pecuniary interest in any of these respirators. Though strongly urged to do so, I refrained from securing them by patent, on the ground that inventions for the prevention of death and disease ought to be sold at the lowest price, and should not, therefore, be encumbered with the expense and restrictions attendant upon patent rights. These respirators have been very successfully manufactured by Mr. W. B. Roof, of 8, Willow Walk, Kentish Town, who sells the one for the mouth alone at 6s. ; the small ori-nasal at 8s. ; and the large ori-nasal at 10s. each.

I am aware that some persons, who admit the deodorizing properties of charcoal, deny that it acts as a disinfectant. I would direct the attention of such persons to the following statement of facts :—About a year ago the bodies of a full-grown cat and two rats were placed in open pans, and covered by two inches of powdered charcoal. The pans have stood during all that time in my laboratory, and though it is generally very warm, not the slightest smell has ever been perceptible, nor have any injurious effects been experienced by any of the nine or ten persons by whom the laboratory is daily frequented.

Now, had the body of these animals been left to putrify under ordinary circumstances, not only would the stench emitted have been intolerable, but some of the persons would certainly have been struck down by fever or other malignant disorders. Within the last few months charcoal powder has been most successfully employed both at St. Mary's and St. Bartholomew's Hospitals, to arrest the progress of gangrene and other putrid sores. The charcoal does not require to be put immediately in contact with

the sores, but is placed above the dressings, not unfrequently quilted loosely into a little cotton wool. In many cases patients who were rapidly sinking have been restored to health.

In the instance of hospital gangrene, we have to deal not only with effluvia, but also with real miasmata; for, as is well known, the poisonous gases emitted by gangrenous sores not only affect the individual with whom the mischief has originated, but readily infect the perfectly healthy wounds of any individuals who may happen to be in its vicinity. So that in this way gangrene has been known to spread not only through one ward, but through several wards of the same hospital.

Within the last few weeks the dissecting room at St. Bartholomew's Hospital has been perfectly deodorized by means of a few trays filled with a thin layer of freshly heated wood charcoal. A similar arrangement will, in all probability, be likewise soon applied to the wards of St. Bartholomew's, and every other well-conducted hospital.

From these and other considerations, therefore, I feel perfectly confident that charcoal will prove by far the cheapest and best disinfectant.

Unlike many other disinfectants, it evolves no disagreeable vapors, and if heated in close vessels, will always act, however long it has been in use, quite as effectively as at first.

If our soldiers and sailors, therefore, when placed in unhealthy situations, were furnished with charcoal respirators, such as the second form above described, and if the floors of the tents and the lower decks of ships were covered by a thin layer of freshly burnt wood charcoal, I think we could have little in future to apprehend from the ravages of cholera, yellow fever, and similar diseases by which our forces have of late been decimated. If found more convenient, the charcoal powder might be covered with coarse canvas, without its disinfectant properties being materially impaired.

The efficiency of the charcoal may be greatly increased by making it red-hot before using it. This can easily be done by heating it in an iron saucepan covered by an iron lid.

When the charcoal is to be applied to inflammable substances, such as wooden floors, &c., of course it must be allowed to cool in close vessels before being used.

[Two or three additional sentences have been added, but all the rest of the Letter remains exactly as it appeared in the *Times* of the 22d November last.]—*Lond. Pharm. Jour. Jan. 1855.**

ON THE METHOD OF EXHIBITING OPIUM AND ACETATE OF
LEAD IN CHOLERA.

By M. DONOVAN, Esq., M.R.I.A.

“Homines ad deos nulla re propius accedunt quam salutem hominibus dando.”—CICERO.

The combination of opium and acetate of lead has been recommended as the best remedy in cholera by one section of the faculty; by another its efficacy has been doubted or denied; and by a third it has in some forms of the disease been considered noxious. On this question I shall be silent; but as the combination has been much employed, I shall offer some suggestions relative to the mode of exhibition.

It is for the consideration of the physician, in the first place, is the form of pill the most advantageous for the patient? We know the rapid progress of cholera; a few hours are often sufficient to bring the tragedy to its final catastrophe. Time is, therefore, of the greatest value; and not an avoidable moment should be lost. Opium and acetate of lead are generally made into pills by means of mucilage of gum arabic; for it is known that vegetable extracts decompose the acetate. But pills made with mucilage when dry become exceedingly hard, as will appear from the following experiment:—I charged a pistol with fifteen grains of gunpowder, and over the wadding introduced twenty pills, such as I have alluded to. I used as a target a hat-box, the top and bottom of which consisted of deal laminæ, each about one-twelfth of an inch thick. On discharging the pistol, the pills passed through the top and bottom of the box, and even made some impression on the plastered wall behind. Each pill

[*Owing to the publication of a notice of the views of Dr. Stenhouse in the 26th volume of this Journal, some of our readers may deem this as superfluous, but the importance of the subject is our only apology.—ED. AM. JOUR. PHARM.]

consisted of two grains of acetate of lead and a quarter of a grain of opium made into a mass with mucilage; they were allowed to dry in the air. Such pills required more than an hour to soften in water, and they were then far from being dissolved.

These facts are unfavorable to the choice of pills as a form calculated for the emergencies of cholera. But it may be objected against the liquid form, that the stomach will not retain the remedy in that state. If the stomach will not endure a teaspoonful of a liquid, it is probable that it will not retain anything; frequent repetitions of the dose, although each may be rejected, will amount at least to the continued action of one retained dose. If these arguments fail to convince, it will probably be conceded that if pills are to be used, they should be made immediately before they are wanted, and as soft as is consistent with retaining their shape; in a few hours they will become hard. A very small bolus were still better.

We have now to consider whether the combination of opium and acetate of lead is not open to a chemical objection which ought to have some influence with the practitioner. Opium consists of a variety of substances; thirteen at least are known—viz., morphia, codeine, narcotine, thebaine, pseudomorphine, porphyroxine, narceine, papaverine, meconine, caoutchouc, coloring matter, sulphates, and meconic acid. The two last, especially, and some of the others, decompose acetate of lead. The sulphate and meconate of lead, and some of the other compounds thus produced, are insoluble. Insolubility is a great obstacle to the exertion of medicinal power; morphia in its uncombined state is scarcely soluble, and hence is comparatively inactive; but every one knows how different the case is when it is rendered soluble by combination with an acid. Sulphate of barytes is insoluble and inert; but the soluble salts of barytes are poisons. It is therefore probable that the insoluble compounds formed in the case of opium and acetate of lead possess activity in a very inferior degree. Would it not be preferable to use a formula in which all the active ingredients are allowed to act with full energy? A mixture of solution of acetate of lead with solution of acetate of morphia undergoes no decomposition, and both salts would act without any diminution of power.

But acetate of morphia is not the representative of opium; beside morphia, opium contains codeine, an efficient sedative and hypnotic. Codeine exerts a specific action on the semilunar ganglion and solar plexus which supplies the intestinal canal, and on the branches of the great sympathetic, which, with so many others, supplies the stomach. In its pure state codeine is much less active than when combined with an acid. It should therefore be employed in the state of an acetate; for this salt does not decompose acetate of lead; the dose may be an eighth of a grain, repeated at intervals.

Dr. Gregory's hydrochlorate of morphia-and-codeine would be an admirable sedative with acetate of lead but for the production on mixture of the difficulty soluble chloride of lead.

But it is said that acetate of morphia is sometimes of uncertain effect, on account of the spontaneous evolution of a portion of its acetic acid, and even its partial decomposition by water. To obviate this loss of power, if such take place, some free acetic acid should be added to the mixture. Such addition is also advisable on another account; acetate of lead sometimes contains carbonate of lead, and this is believed to be the most noxious portion of the salt; but the carbonate cannot exist in presence of acetic acid. Little fear need be entertained about the action of acetate of lead thus purified: Sir Henry Marsh informs me that he has frequently given twelve grains in the day in three-grain doses, and never could perceive any ill effect; larger doses have been reported by others.

The following will afford a liquid representative of opium and acetate of lead:—

Take of

Acetate of lead	Two grains.
Acetate of morphia . . .	One-twelfth of a grain.
Acetate of codeine . . .	One-eighth of a grain.
Distilled vinegar	Half a drachm.
Distilled water	One drachm.

Mix for a draught. Such draughts commence their action as soon as swallowed; they may be repeated at proper intervals; or immediately, if rejected from the stomach.—*Annals of Pharmacy*, Dec. 1854.

IMPROVEMENTS IN THE COMPOSITION OF PAINT.

By MR. C. BINKS.

In the manufacture of these improved compositions of paints, Mr. Binks forms in the first place what are called and are well known as insoluble soaps; that is, combinations of certain earthy and metallic oxides with oils or fatty matters, which combinations, having a general composition chemically analogous to common soaps, but being insoluble in *water*, are hence called insoluble soaps, in contradistinction to the compounds or soaps that result from the union of fatty matters with oxides of the alkaline metals.

These so-called insoluble soaps he dissolves in spirits of turpentine, or in naphtha, or other volatile solvent, and employs the resulting solutions as substitutes for linseed or other drying oils, in the manufacture of paints.

Any pigment (as, for example, white lead, oxide of zinc, lamp-black, or any other,) he grinds in a solution (in turpentine or other volatile solvent) of the insoluble soap; and the resulting mixture or paint so produced, on being used as paint in the usual manner, has the property of drying with great rapidity, and of forming in all respects, as in color, body, compactness, durability, and other essential properties, an excellent and superior composition as paint.

Secondly, he adds glycerin to ordinary paints, or uses and applies glycerin as part of the composition of paints. To paints composed of the usual materials—as, for example, of some pigment ground in linseed oil—he adds glycerin in order to thin or prepare the paint for use, and to act as a substitute for linseed or other oil, or for turpentine, &c., commonly employed to thin paints for use; or he grinds the pigment in glycerin, or in a mixture of drying oil and glycerin, and thins the paint so produced with glycerin for use, or with a mixture of glycerin and some drying oil. The advantages of this application of glycerin consists chiefly in its being inodorous, in its cheapness (being at present a waste product of processes used for saponifying fatty matters), and in its property of giving a fine gloss to any paint it is added to.—*Annals of Pharmacy*, Dec. 1854.

Varieties.

On Perfumery. By SEPTIMUS PIESSE.

(Continued from page 82.)

BOUQUETS AND NOSEGAYS.

In the previous articles we have endeavored to explain the mode of preparing the primitive perfumes—the original odors of plants. It will have been observed that while the majority can be obtained under the form of otto or essential oil, that there are others which hitherto have not been isolated, but exist only in solution in alcohol, or in a fatty body. Of the latter are included all that are most prized, with the exception of otto of rose—that diamond among the odoriferous gems. Practically, we have no essential oils of jessamine, vanilla, tuberose, cassie (black currants), violets, and others. What we know of these odors is derived from esprits, obtained from oils or fats, in which the several flowers have been repeatedly infused, and afterwards infusing such fats or oils in alcohol. Undoubtedly, these odors are the most generally pleasing, while those made from the essential oils, dissolved in spirit, are of a secondary character. The simple odors, when isolated, are called *ESSENTIAL OILS*, or *OTTOS*; when dissolved or existing in solution in alcohol, by the English they are termed *ESSENCES*, and by the French *EXTRAITS*, or *ESPRITS*; a few exceptions prove this rule. Essential oil of orange peel, and of lemon peel, are frequently termed in the trade "*Essence*" of orange and "*Essence*" of lemons, instead of essential oil or otto of lemons, &c. The sooner the correct nomenclature is used in perfumery, as well as in the allied arts, the better, and the less blunders will be made in the dispensatory. It appears to the writer, that if the nomenclature of these substances was revised, it would be serviceable; he would suggest, as a significant, a brief and comprehensive adjective, *Otto*, be used as a prefix to denote that such and such a body was the odoriferous principle of the plant. We should then have otto of lavender instead of essential oil of lavender, &c., &c. Where there exists a solution of an essential oil in a fat oil, the necessity of some such significant distinction is rendered obvious, for commercially such articles are still called "*oils*"—oil of jasmin, oil of roses, &c. It cannot be expected that the public will use the words "*fat*" oil and "*essential*" oil, to distinguish these differences of composition.

There are several good reasons why the odoriferous principle of plants should not be denominated oils. In the first place, it is a bad principle to name any class of substances with the same signification as those belonging to another. Surely, there are enough distinguishing qualities in their composition, their physical character and chemical reaction, to warrant a sig-

nificant name to that large class of substances known as the *aroma* of plants!

When the chemical nomenclature was last revised, the organic bodies were little dealt with. We know that we owe this universal "oil" to the old alchemist, much in the same way as "spirit" has been used, but a little consideration about the matter quickly indicates the folly of its continued use. We can no longer call otto of rosemary, or otto of nutmegs, essential oil of rosemary or nutmegs, with any more propriety than we can term sulphuric acid "oil" of vitriol. All the chemical works speak of the odoriferous bodies as "essential" or "volatile" oils, and of the greasy bodies as "fat" or "unctuous" oils. Oils, properly so called, unite with salifiable bases, and form soap; whereas, the essential or volatile oils, *i. e.*, what we would please to call the *ottos*, do no such thing. On the contrary, they unite with acids in the majority of instances.

The word oil must hereafter be confined to those bodies to which its literal meaning refers—fat, unctuous, inodorous (when pure), greasy substances—and can no longer be applied to those odoriferous materials which possess qualities diametrically opposite to oil. We have grappled with "spirit," and fixed its meaning in a chemical sense; we have no longer "spirit" of salt, or "spirit" of hartshorn. Let us no longer have almond oil "essential," almond oil "unctuous," and the like.

It remains only for us to complete the branch of perfumery which relates to odors for the handkerchief, by giving the formulæ for preparing the most favorite "boquets" and "nosegays." These, as before stated, are but mixtures of the simple *ottos* in spirit, which, properly blended, produce an agreeable and characteristic odor, an effect upon the smelling nerve similar to the mixture that harmonious sounds produce upon the nerve of hearing, that of pleasure.

BOUQUET D'AMOUR.

Esprit de rose	}	from pomade }	of each . . .	1 pint.
" jasmin				
" violette				
" cassie	}			
Extract of musk				
" ambergris	}		of each .	$\frac{1}{2}$ pint.

Mix and filter.

BOUQUET DES FLEURS DU VAL D'ANDORRE.

Extrait de jasmin	}	from pomade, }	of each . . .	1 pint.
" rose				
" violette				
" tuberose	}			
Extract of orris				
Otto of geranium	}			$\frac{1}{4}$ oz.

BUCKINGHAM PALACE BOUQUET.

Extrait de fleur d'orange	} from } pomade, }	of each	1 pint.
" cassie			
" jasmin			
" rose			
Extract of orris	} of each	. . .	½ pint.
" ambergris			
Otto of neroly	.	.	½ drachm.
" lavender	.	.	½ drachm.
" rose	.	.	1 drachm.

BOUQUET DE CAROLINE; also called BOUQUET DES DELICES.

Extrait de rose	} from } of each	1 pint.
" violette		
" tuberosa		
Extract of orris	} of each	½ pint.
" ambergris		
Otto of bergamot	} of each	½ oz.
" Limette		
" cedrat		

THE COURT NOSEGAY.

Extrait de rose	} of each	1 pint.
" violette		
" jasmin		
Espirit de rose triple	.	1 pint.
Extract of musk	} of each	1 oz.
" ambergris		
Otto of lemon	} of each	½ oz.
" bergamot		
" neroly		1 drachm.

EAU DE CYPRE.

This is an old-fashioned French perfume, presumed to be derived from the *Cyperus esculentus* by some, and by others to be so named after the Island of Cyprus; the article sold, however, is made thus—

Extract of musk	.	1 pint.
" ambergris	} of each	½ pint.
" vanilla		
" tonquin bean		
" orris		
Espirit de rose triple	.	2 pints.

The mixture thus formed is one of the most lasting odors that can be made.

ESTERHAZY BOUQUET.

Extrait de fleur d'orange (from pomade)	.	.	.	.	1 pint.
Espirit de rose triple	.	.	.	.	1 pint.
Extract of ritivert	}	of each	.	.	1 pint.
“ vanilla					
“ orris					
“ tonquin					
Espirit de neroly	.	.	.	.	1 pint.
Extract of ambergris	.	.	.	.	$\frac{1}{2}$ pint.
Otto of santal	.	.	.	.	$\frac{1}{2}$ drachm.
“ cloves	.	.	.	.	$\frac{1}{2}$ drachm.

Notwithstanding the complex mixture here given, it is due to the vitivert that gives this bouquet its peculiar character. Few perfumes have excited greater *furor* while in fashion.

Ess BOUQUET.

The reputation of this perfume has given rise to numerous imitations of the original article, more particularly on the continent. In many of the shops in Germany and in France will be seen bottles labelled in close imitation of those sent out by Bayley and Co., Cockspur street, London, who are, in truth, the original makers.

Espirit de rose triple	.	.	.	.	1 pint.
Extract of vanilla	.	.	.	.	2 oz.
“ orris	.	.	.	.	8 oz.
Otto of lemons	.	.	.	.	$\frac{1}{2}$ oz.
“ bergamot	.	.	.	.	1 oz.

The name “ess” bouquet, which appears to puzzle some folks, is but a mere contraction of “essence” of bouquet.

EAU DE COLOGNE. (*Le Premier qualitie.*)

Spirit (from grape), 60 over proof	.	.	.	.	6 gallons.
Otto of neroly, <i>Petale</i>	.	.	.	.	3 oz.
“ “ <i>Biggarade</i>	.	.	.	.	1 oz.
“ rosemary	.	.	.	.	2 oz.
“ orange peel	.	.	.	.	5 oz.
“ citron pœl	.	.	.	.	5 oz.
“ bergamot pœl	.	.	.	.	2 oz.

Mix with agitation; then allow it to stand for a few days perfectly quiet, before bottling.

EAU DE COLOGNE. (*Le Deuxième qualitie.*)

Spirit (from corn)	.	.	.	.	6 gallons.
Otto of neroly, <i>Petit-grain</i>	.	.	.	.	2 oz.
“ “ <i>Petale</i>	.	.	.	.	$\frac{1}{2}$ oz.
“ rosemary	.	.	.	.	2 oz.
“ orange peel	}	each	.	.	4 oz.
“ lemon					
“ bergamot					

Although eau de Cologne was originally introduced to the public as a sort of "cure-all," a regular "elixir of life," it now takes its place not as a pharmaceutical product, but among perfumery. Of its remedial qualities we can say nothing, such matter being irrelevant to the purport of these articles. Considered, however, as a perfume, with the public taste it ranks very high; and although it is exceedingly volatile and evanescent, yet it has that excellent quality which is called "refreshing." Whether this be due to the rosemary or to the spirit we cannot say, but think something may be attributed to both. One important thing relating to eau de Cologne must not, however, pass unnoticed, and that is, the quality of the spirit used in its manufacture. The utter impossibility of making brandy with English spirit in any way to resemble the real Cognac, is well known. It is equally impossible to make eau de Cologne with English spirit, to resemble the original article. To speak of the "purity" of French spirit, or of the "impurity" of English spirit, is equally absurd. The fact is, that spirit derived from grapes, and spirit obtained from corn, have each so distinct and characteristic an aroma, that the one cannot be mistaken for the other. The odor of grape spirit is said to be due to the œanthic ether which it contains. The English spirit, on the other hand, owes its odor to fusel oil. So powerful is the œanthic ether in the French spirit, that notwithstanding the addition to it of such intensely odoriferous substances as the ottos of neroly, rosemary, and others, it still gives a characteristic perfume to the products made containing it, and hence the difficulty of preparing eau de Cologne with any spirit destitute of this substance.

Although very fine eau de Cologne is often made by merely mixing the ingredients as indicated in the recipe as above, yet it is better, first, to mix all the citrine ottos with spirit, and then to distil the mixture, afterwards adding to the distillate the rosemary and nerolics, such process being the one adopted by the most popular house at Cologne.

A great many forms for the manufacture of eau de Cologne have been published, the authors of some of the recipes evidently having no knowledge, in a practical sense, of what they were putting by theory to paper; other venturers, to show their lore, have searched out all the aromatics of "Lindley's Botany," and would persuade us to use absinthe, hyssop, anise, juniper, marjoram, caraway, fennel, cumin, cardamom, cinnamon, nutmeg, serpolet, angelica, cloves, lavender, camphor, balm, peppermint, galanga, lemon, thyme, &c., &c., &c.

All these, however, are but hum——! Where it is a mere matter of profit, and the formula that we have given is too expensive to produce the article required, it is better to dilute the said Cologne with a weak spirit, or with rose water, rather than otherwise alter its form; because, although weak, the true aroma of the original article is retained.

The recipe of the second quality of eau de Cologne is given, to show that a very decent article can be produced with English spirit.

BOUQUET DE FLORA; otherwise, EXTRACT OF FLOWERS.

Esprit de rose	} from pomade }	of each	. 1 pint.
" tubereuse			
" violette			
Extract of benzoin	.	.	1½ oz.
Otto of bergamot	.	.	2 oz.
" lemon	} each	. . . . .	½ oz.
" orange			

THE GUARD'S BOUQUET.

Esprit de rose	.	.	.	.	2 pints.
" neroly	.	.	.	.	½ pint.
Extract of vanilla	.	.	.	.	2 oz.
" orris	.	.	.	.	2 oz.
" musk	.	.	.	.	½ pint.
Otto of cloves	.	.	.	.	½ drachm.

FLEUR D'ITALIE; or, ITALIAN NOSEGAY.

Esprit de rose, from pomade	.	.	.	2 pints.
“ rose triple	.	.	.	1 pint.
“ jasmin	} from pomade, each	.	.	1 pint.
“ violette				
Extract of cassie	.	.	.	½ pint.
“ musk	} each	.	.	2 oz.
“ ambergris				

JOCKEY CLUB BOUQUET. (*English formula.*)

Extract of orris root	2 pints.
Esprit de rose triple	1 pint.
“ rose de pomade	1 pint.
Extrait de cassie } de pomade, each	½ pint.
“ tubereuse }	
“ ambergris	½ pint.
Otto of bergamot	½ oz.

JOCKEY CLUB BOUQUET. (*French formula.*)

Esprit de rose, de pomade	.	.	.	1 pint.
" tubereuse	"	.	.	1 pint.
" cassie	"	.	.	½ pint.
" jasmin	"	.	.	½ pint.
Extract of civet	"	.	.	3 oz.

Independent of the materials employed being different to the original English recipe, it must be remembered that all the French perfumes are made of brandy, i. e., grape spirit; whereas the English perfumes are made with corn spirit, which alone modifies their odor. Though good for some, yet for others the grape spirit is very objectionable, on account of the predominance of its own aroma.—*Annals of Pharmacy*, April, 1854.

A new Sugar Plant.—The scarcity of corn in France has drawn attention to a new plant recently introduced from China, which promises to supercede, to a certain extent, the use of beet root in the manufacture of sugar and the distillation of alcohol. The Agricultural Committee of Toulon has recently addressed a report to the Minister of War, with respect to the use of the plant in question. It is called the *sorgho* or *holcas saccharatus*, and was first introduced into France in 1851 by M. de Montigny, the French Consul in China, who sent some grains of the seed to the Government. Since then the culture of the plant has been commenced with success in Provence, and promises to be of great advantage to Algeria. The *sorgho* has been called the "sugar cane of the North of China," and numerous experiments have recently been tried with a view to ascertaining if it possesses the properties necessary for producing a crystallizable syrup, so as to become a rival to sugar cane and beet-root. According to the report of the Toulon Agricultural Association, it would appear to have those properties. The fact has been ascertained by a series of experiments made in the department of the Var. It also appears to be richer in saccharine principle than any known plant, except the vine. Beet-root contains from eight to ten per cent. of sugar; the *sorgho* produces from sixteen to twenty per cent. from which eight or ten per cent. of pure alcohol, fit for all industrial and domestic purposes, can be produced. The refuse is excellent food for cattle, who are very fond of it. The plant grows with great rapidity, and does not require irrigation. The *sorgho* is not a new discovery, as it has been used from time immemorial by the inhabitants of the north of China, by whom large quantities of sugar is extracted from it. But this is the first time it has been produced on any thing like an extensive scale in Europe.—*English paper.*

Serpents' Bite and other Poisoned Wounds.—Dr. Brainard, of Chicago, in an interesting essay on "treating Serpent bite and other poisoned wounds," concludes with the following observations:—

The result of my experiments, taken in connection with those made by others, is, that up to the present time, no substance or solution has been found capable of preventing the fatal effects of the rattlesnake bite (unless destroying by caustic or excising the tissues of the part) excepting the solution of iodine. This, within certain limits, is capable of neutralizing it.

In order to guard against error, it should be stated that, in experimenting with birds, the separation of skin by injecting even distilled water and applying cupping-glasses, is liable to cause the skin to fall off in scales. When the skin is not extensively separated, the solution recommended does not produce an eschar. The effects of iodine solutions on the tissues, since the publication of Velpéau's work on the subject, are so well understood that it is unnecessary to dwell further on this point.

The effect of solutions of iodine, infiltrated into the tissues around the bite of the rattlesnake, is to prevent their discoloration and preserve the natural texture and color of the parts. Even when it does not prevent death from occurring, it still has this effect in a great degree.

The deductions which I think may legitimately be made from the foregoing facts, are—

1. The venom of the crotalus produces spasm of all the muscles—most marked in the muscles of respiration.

- 2d. This venom produces a peculiar change of the blood globules which consist of alteration of form and disintegration.

3. If death is delayed, it deprives the blood of its fibrina.

4. The solution of iodine and iodide of potassium, in the proportion of ten grains of the former and thirty of the latter to the ounce of distilled water, is, within certain limits, an antidote to the venom of the rattlesnake.

5. When the venom is deeply inserted, or when it has been absorbed, the antidote, to be effectual, must be infiltrated into the tissues.

6. This infiltration can be performed without causing loss of substance, or producing either eschar or suppuration.—*The Western Journal*.

Improvement in the Manufacture of Baker's Yeast. BY M. C. GUTKIND, of Paris.—The new method consists in completely saccharifying the starch contained in barley. The barley is slightly malted, dried in a rapid current of warm air, taking care to prevent smoke coming in contact with the grain. The malt thus prepared is reduced to the condition of the finest flour possible, without bolting it; that is the flour and bran should not be separated. This flour is introduced into a vat, the size of which varies according to the quantity of yeast intended to be prepared at each operation. Water at a temperature of 40° Centigrade (104° Fahr.) is introduced into the vat sufficient to make the flour into dough like that for making bread; this dough is then diluted with a farther quantity of water, at the same temperature, to the consistence of porridge. M. Gutkind prefers using, for every 100 killogrammes of flour (= 220.48 lbs.), 2 hectolitres (= 44 gallons) of warm water. When the porridge is made, it is introduced into a boiler, where it is gradually heated to 81° Centigrade (177.8 F.). As soon as it reaches this temperature, the fire or steam, whichever be employed is arrested, in order that the temperature of the porridge, become sensibly more fluid, may not pass that degree.

The liquid mass is now introduced into bags of canvas, and submitted to the action of a press, by which the essentially liquid portion, which is very saccharine, is squeezed out; this liquid is kept in large vats, where it cools. The solid matter remaining in the bags is again placed in a vat, and treated with a fresh quantity of water at 114 Fahr., in the proportion of 111 gallons of water to 441 lbs. of residue. The mixture is stirred so as to

form a porridge, which is re-introduced into the boiler, and heated to a temperature of 201° Fahr., at which it is maintained for one hour. The mass is then pressed as before in bags of coarse canvas; as it is rich in nitrogenous compounds, which form the base of the yeast. The liquors resulting from both operations are mixed together; and are exposed to the action of the air in large uncovered vats during two, three, and even for ten days, according to the external temperature.

This exposure to the air is one of the chief points in the new method. In order to set the liquid in fermentation, it is re-warmed to a temperature of 89.6° Fahr., and a small quantity of fresh yeast stirred up in a little warm water added. The fermentation sets in very soon, and may be conducted either in barrels or in vats, around which a temperature of 59° Fahr. should be maintained during the whole operation.

The yeast obtained by means of this process possesses the following properties:—

1. The raising power is much superior to that of all other yeast; 2. It has no bitter or acid taste, and consequently is admirably adapted for pastry work; and 3. It is of an extreme whiteness, and consequently does not require to be washed—hence it preserves all its force.

The residue remaining after the fermentation may be employed to make vinegar.—*Pharm. Journ. from Le Genie Industriel*, June, 1854.

Influence of Elevation of Soil on the Mortality from Cholera.—In the report on cholera in 1849, by the Registrar-General (see this Journal for Nov. 1853, p. 189, and for June, 1854, p. 100,) it is stated that the elevation of the soil in London has a more constant relation with the mortality from cholera than any other known element—the mortality being in the inverse ratio of the elevation; and so exactly has this been verified in the present epidemic, that a scale of premium might safely have been drawn out in 1849 to rule in 1854 to the following effect: For a person of average condition dwelling under 20 feet of elevation, the premium to insure 1,000*l.* would be 12*l.*; while for those living at from 100 to 350 feet elevation, the Life Office would be secure with 2*l.* premium. But the following facts worked out by the Registrar-General, show distinctly the inverse relation that the mortality of cholera bears to the elevation of the ground:—

182,560 of the people of London, in 1851, lived upon sub-districts covering 2,849 acres of the marsh ground, ranging from 3 feet below to 1 foot above the high-water mark; 2,693 died there of cholera in 1849, and 2,227 in 1854, or 4,920 in the two epidemics.

263,914 of the population, in sub-districts on 12,146 acres of ground of 80 feet of elevation and upwards, lost 398 persons by cholera in 1849, and 272 in 1854, or 670 in the two epidemics,

12,824 persons died of cholera in the two years 1849 and 1854 on the 18,429 acres of low ground under 10 feet of elevation, out of a population

of 595,119; while in the same years, out of the more numerous population, 682,795 persons, living on 21,909 acres of the higher ground of 60 feet and upwards, only 2,949 persons died of cholera, including all the deaths in the district of St. James.

On the lowest ground, taking the mean of the two epidemics, *thirteen* in 1,000 of the population—on the highest ground *one* in 1,000 of the population—were destroyed by cholera.

At the intermediate stages of elevation was the danger of dying by cholera intermediate? To solve this important question as regarded the epidemic of 1849, London, was first sub-divided into terraces differing 20 feet in elevation; and if the same course is pursued now, it is found that in the two epidemic years 15,562 persons died of cholera on the first terrace under 20 feet of elevation; 3,757 on the second terrace of ground, 20 and under 40 feet high; 2,301 on the third terrace, 40 and under 60 feet; 2,279 on the fourth terrace, 60 to 80 feet high; 392 on the fifth terrace, 80 to 100 feet; 278 on the higher terraces of 100 feet up to 350 feet. The population was 850,000 on the lowest terrace; and about equal, or 400,000, on the second, the third, and the fourth terraces; while it was 142,000 on the fifth, and 121,000 on the higher terrace or terraces.—*Medical News*.

Editorial Department.

AMERICAN PHARMACEUTICAL ASSOCIATION.—This body, at its last meeting in Cincinnati, adjourned to meet in New York city, on 2d Tuesday (11th) of September next. As the period is a favorable one for the business visits of our southern and western friends, we hope that they will try and make it convenient to attend the meeting, and give at least the courtesance their presence will afford to a movement calculated greatly to benefit the entire pharmaceutical profession. It is suggested that as hereafter these meetings will have a more scientific cast, and be more interesting to all who may attend, it is to be hoped that each individual will bring a quota of information, statistical, scientific, or practically useful, and that the *proceedings* may embody these in a digest for the benefit of those not in attendance.

CAVENDISH SOCIETY.—Our readers who are interested in this society are requested to examine the advertisement in the appended sheet. We regret to learn that the first volumes of Lehmann's *Physiological Chemistry* are already *out of print*, and cannot be supplied to future subscribers. The agent announces the receipt of two new volumes for the subscribers, Bischof's *Elements of Chemical and Physical Geology* (vol. 1st.), and

Dr. Henry's life of Dalton. We hope to be able to notice these volumes in our next number.

ANNALS OF PHARMACY AND PRACTICAL CHEMISTRY, London.—In the December number of this journal, the editors, who are also the proprietors, announce its discontinuance, owing to deficient patronage. The editorial course of this journal has been marked with extreme bitterness against the Council of the Pharmaceutical Society. Many of its articles against members of that body are filled with offensive personalities altogether unfitted for the pages of a scientific journal, and which, continued so pertinaciously as they have been, could not fail to react against their authors. It is to be regretted that the talents and energy displayed by the editors should be thus turned aside from the cause of science, and their journal, from which we have frequently derived articles of interest, should cease to exist.

NEW YORK JOURNAL OF PHARMACY.—We are informed by a gentleman of New York, that Mr. Charles Shields, the proprietor of the New York Journal of Pharmacy, has discontinued its publication, chiefly owing to the indifference manifested by the subscribers in not paying up their dues, as well as from lack of interest on the part of those who should feel a pride in supporting and encouraging it. Dr. Antisell, the late editor of the New York Journal, has, we understand, gone to Mexico on scientific business. Scientific Journalism is uphill work in this country, and unless it can be made to appear to be to the pecuniary interest of subscribers, a large number will give you the cold shoulder. We know of an instance of a druggist in good business, who was in the habit of *borrowing* our journal and extracting from it receipts and other practical items useful to him.

PHARMACY IN CANADA.—We learn from the *Montreal Medical Chronicle* for Jan. 1855, that a meeting of druggists' assistants and apprentices was held on the 17th of November, 1854, with a view to effecting an organization for mutual improvement in professional qualifications. The Society then formed was named the "Montreal Pharmaceutical Association," to preside over which the following gentlemen were elected as officers for one year, viz., Johnston Beer, *President*; Richard Jenner, *Vice President*; Charles Vanfelson, *Secretary*, and Kenneth Campbell, *Treasurer*.

This movement is a favorable indication of the progress of the reform which is now actively operating in Great Britain. The pharmacutists themselves should follow the example of their subordinates, and establish a pharmaceutical society analogous to the several branches of the London Society at Liverpool, Manchester, Edinburg, etc., which would give a great impetus to Canadian pharmacy.

PHARMACY IN NEW YORK.—After carefully reading over the following anonymous article, which originally appeared in the *New York Daily Times*, we are at a loss to decide whether it was written by a dissatisfied drug clerk, or a critically disposed physician, for there is too much knowledge displayed to attribute it to an uninitiated person, at the same time that there are several points which indicate a want of information hardly attributable to a regular pharmacist, and we should think no well disposed member of the fraternity would use the columns of a newspaper to discuss the subject, however deserving of exposure, in the manner it has been done in the *Times*. The story about jalap is rather fishy, as the substitute is far milder than the article directed, and has less tendency to produce delirium than the quinine that preceded it. The statement in the seventh paragraph about the influx of spurious drugs into New York will hardly be admitted by Dr. Bailey as applying to the Custom House, and perhaps relates more to past times than the present—unless there is some “underground railroad” sort of way of introducing them. In alluding to the remedy, the writer in recommending an examination of the apothecaries makes no allusion to the New York College of Pharmacy, which has long been employing its influence for good in that direction. There is so much truth in some of the statements, when applied to this city, that we give the article a place for the benefit of those concerned, both medical and pharmaceutical.

Startling Abuses in the Retail Drug Trade.—The Remedy.—There is no business whatever in which the public ought to feel more interest, and to which they pay less attention, than the retail drug trade. If a man wants a dose of medicine, he thinks it sufficient if he got it out of some store with a projecting window with a big red and blue bottle in it. It never occurs to him to consider whether the druggist is acquainted with his business, and a judge of the quality of the medicine which he dispenses.

To qualify a man to keep a drug store, a thorough knowledge of Latin is requisite. He should know at least the rudiments of the Greek language, and be practically acquainted with Chemistry and Botany. He should have such an accurate acquaintance with medicine as to be able, at a glance, to detect impure and spurious drugs. How few of all those in the business are so qualified?

Too often, the drug business affords a refuge to those who have failed in other businesses. Men who “burst up” in dry goods have succeeded in drugs, and got rich on their little quackeries and nostrums. All these gentlemen stick M. D. to their names, and will “undertake” anything, from the manufacture of “refined liquorice” to the “embalming of the dead,” whom they will warrant to keep until the general resurrection.

These pretenders foist off molasses and water as a blood-purifier, under the name of sarsaparilla. They are the sole inventors of some wonderful remedy for coughs and colds. Their cholera and colic mixture is quite infallible, while their venereal remedies, which they, delicately, style “vegetable elixirs,” were never known to fail in effecting a speedy cure.

Many of these empirics have stores in the meaner districts of the city, and it is astonishing what sums they receive for their “advice” from the poor. They lie in wait for thoughtless sailors, and reckless California

passengers, and "screw out" of them large sums for medicines to protect them from the diseases and influences of any climate !

A great many drug-stores belong to physicians ; but as it is considered *infra dig.* to be connected with a store, they usually carry on the "shop" under another name. In such cases they avail themselves of the services of some unfortunate foreigner, whose necessities compel him to accept of from \$3 to \$5 a week, the usual pay of drug-store clerks for seventeen hours' attendance daily for six days in the week, and nineteen hours on Saturday.

There is more ignorance or rascality displayed in the drug trade than in any other. The quantity of spurious drugs which is introduced daily into New York is immense. Besides, the adulterating of drugs is carried on as a regular business in this city. It is only a short time ago since an advertisement appeared in one of our contemporaries for upwards of a week "for a person acquainted with the adulteration of drugs." No doubt the advertiser had, to use a business phrase, "a host of applicants." The sale of these adulterated drugs proves one of two things : First, that the retail druggists, being ignorant of their business, buy these drugs as genuine of the wholesale houses ; or that, being acquainted with their business, they buy them for the sake of the extra profit which such drugs will fetch. It is not uncommon for even "respectable" druggists to "palm off," at sixpence an ounce, common senna, which costs fifteen cents a pound, for Alexandria, which costs from seven to nine cents a pound extra. Three hundred per cent. profit would satisfy most traders, but the druggists go in for from four to five hundred per cent., and as much more as they can get, but inasmuch as much of their stock is perishable, and they are obliged to keep a large assortment for which there is very little call, this per centage is not as unfair as may at first seem.

From what we have said, some might suppose that the adulteration and imitation of drugs were confined exclusively to the wholesale trade. But such is not the case. Labels for French perfumery and for various patent medicines are to be had in all the wholesale stores, and are bought and used extensively by almost every retail store in the city.

Quack medicines, for the sake of the one hundred per cent. profit which they yield, are sold by every retail store in the city ; while the most simple analysis or synthesis would show that they are not only deleterious but positively poisonous.

One, who was a farm laborer, then a horse-jockey, and now is self-styled an M. D., who has a store and manufactory a few miles from town, and a "desk" in an office in the city, informed us some time ago of the ingredients of one of his nostrums, which is regularly advertised as "one of the blessings of the age," and asked our opinion of it. On our expressing our surprise at his daring to sell such stuff, he admitted that the "blessing was a leetle strong," and that on being *dared* to drink a twenty-five cent bottle of it, he nearly killed himself, although he vomited the whole in half an hour after taking it.

As the imitation and adulteration of drugs is not confined to the wholesale houses, neither are all the other rascalities in the business to be laid at their doors.

Our readers cannot fail to have noticed the great number of drug-stores which are daily advertised for sale in all parts of the city. The preparing and stocking of these stores for sale is carried on as a regular business. An old mechanic or bankrupt dry goods man has sometimes two stores "doing an excellent family business, in most desirable localities," for sale. Before the stores are advertised, a complete supply of tinctures is made up—and such tinctures ! The directions of all the dispensaries are

set at naught. The tinctures (!) are made up without regard to quality. Cheapness and profit are the only objects in view. A complete stock of the best imitation of genuine medicines is laid in, fictitious transactions are entered in the "Daily Cash Book," and the daily sales are increased by a convenient medical process. And now the store is ready for sale.

The ignorance of those in the drug business, and the negligence and carelessness of physicians, lead to innumerable mistakes, many of which prove fatal.

The United States, London, Edinburgh, and Dublin, publish each a *Dispensatory* or *Pharmacopæia*, for the guidance of apothecaries and physicians. Many of the names for the same drug are entirely different in each of these works. It might be supposed that our medical men would confine themselves in writing their prescriptions to the nomenclature of that very able work, the *United States Dispensatory*.

Such, however, is not the case. It would be difficult to say where many of them picked up their Latinity. It would astonish the men of a much later period than that of CÆSAR or CICERO.

We have recently had access to upwards of two thousand prescriptions. About fifteen hundred of them showed that the writers were entirely ignorant of the declensions to which the various nouns used belonged. Many of them were written in pencil, and almost illegible. If a medical man be applied to in bed for a prescription he may be excused for using a pencil, but in no other situation. Before a prescription reaches an apothecary, it is, not uncommonly, well creased and thumbed, and, if in pencil, next to illegible. No patient who is able to pay his physician should accept from him a prescription in pencil, or one which is indistinctly written. Such lead only to mistakes.

When an erroneous prescription is presented at a drug store, the prescription, if the druggist be ignorant of his business, is made up exactly as it is written. If the druggist knows the nature and quality of medicines, the prescription should be sent to the physician to be corrected. But as no professional man likes to be convicted of an error, it is very seldom that he hears of his own mistakes. A conscientious apothecary informed us, that when he first commenced business, he made a practice of sending all erroneous prescriptions back, but as he invariably lost the custom of the medical men to whom these were sent, he changed his system and corrected the mistakes himself.

We are informed of a fatal mistake which occurred a few weeks ago. A prescription, in which there was a most unusual quantity of prussic acid, with three or four other ingredients, was ordered and left at a drug store. The clerk of the store hesitated to put up the prescription in the absence of his employer, and unwilling to lose a little custom, stated that it was necessary to send down town for one of the ingredients, and that the medicine would be ready in an hour or two. The patient was anxious for the medicine, and sent twice for it. He soon called a third time, and stated that if it was not ready, to give him the prescription, and his father would get the medicine elsewhere. The prescription was returned and made up by some one more ignorant or less scrupulous, and next day the lady was dead of a diseased heart! Diseased hearts cover a multitude of mistakes!

It frequently happens that some drug is ordered which is not in the store of the apothecary to whom the prescription is presented. In such a case, if he be an unscrupulous person, he substitutes some drug of what he considers a similar quality for the one in question. A case of this kind occurred some time ago in the practice of an acquaintance. He was attend-

ing an engineer of a Southern steamer, who was suffering severely from fever and ague. After giving very powerful doses of quinine, the physician ordered podophyllin. The prescription was taken to a drug store in the vicinity of the wharf at which the steamer was lying, and the proprietor having no such medicine, supplied jalap in its stead. Next morning the patient was raving mad, and had to be transferred to the City Hospital, and lost his berth on board of the steamer. When the physician called next day at the drug store to examine the podophyllin, he was so astonished at its effects, he was informed by the apothecary that his clerk had not much experience, and had used the one medicine for the other!

Numerous mistakes occur in stores which frequently change owners. Drugs, in such stores, are put into jars, bottles, and drawers, with names applicable to other medicines. This, too, is frequently done, as some unprincipled druggists say, to test the ability and knowledge of their clerks. It is nothing uncommon to see a whole "nest of drawers" without a single label on them.

A narrow escape from culpable carelessness of this kind occurred in a well-frequented drug store which recently changed proprietors. The clerk's account of the mistake was that, when busy in making up a long *minim* prescription, a girl entered the store crying, and asked for three cents' worth of a medicine very little used. A jar, on which were a gilt and a paper label—the latter intending to intimate that it bore the name of the medicine it then contained, which was that asked for—was hurriedly taken down for the first time that the clerk had been in the store, and the girl was served out of "her turn." Most providentially, the physician was waiting beside his patient, a child, to administer the medicine, when he discovered that a drug had been sent which would have destroyed life, with great agonies, in a few minutes. So much for false labels!

If medical men were aware of the absolute trash which is sold for medicine, they would be careful in recommending particular stores. While many physicians accept of 25 per cent. on the amount of business which they send to the stores of their friends, such recommendations will be viewed with suspicion. They should abandon a percentage which, to say the least of it, is deserving of reprehension.

What then, you ask, is the remedy for this state of things? We answer—first, in so far as the public is concerned. Avoid all stores in which there is a continual change of clerks, and especially if you should be satisfied that they are not receiving more than \$5 a week. No competent person, except in extreme distress, would accept of such a sum. Avoid all dirty stores; all stores, which, from a patch-work like appearance—jars of various sizes and of different patterns, with dissimilar labels—give evidence that they have changed hands repeatedly; all stores where everything is not carefully labelled; and where there is a total absence of anything like system. If you see one set of tinctures on one side of a store, and another set opposite; oils divided in the same manner; spirits, essences, and syrups ranged together, and roots, flowers and seeds jumbled together, and other things in similar confusion;—though you know nothing of medicine, you may be assured that there is neither method nor system in such a store.

Secondly, in so far as the trade is concerned. There are a *few* well educated and thoroughly bred druggists in the city. Let them unite and appoint, for their examination, the very best professors they can obtain in Latin, Chemistry, Botany, and Materia Medica. Let these druggists submit to a searching examination, and obtain a diploma of their qualifications. Such diplomas, by giving the public confidence in their abilities,

will increase their business, and leave their uneducated brethren to the neglect they merit.

There is another plan which might be adopted by the public for its safety and satisfaction, but to it we cannot allude in this article."—*American Medical Monthly from The New York Daily Times.*

PEIRCE PIERCED, OR POLITICS vs. SCIENCE.—From a cotemporary we learn that Dr. Peirce, Examiner of Drugs at the port of Boston—and author of a work on the adulteration of drugs, etc., having, in the opinion of the Secretary of the Treasury, had sufficient opportunity to learn the business of inspecting drugs has been graciously permitted to discontinue his service to the government, that Dr. Joseph H. Smith, of Dover, New Hampshire, may have a chance to acquire some knowledge of the art and mystery of drug-judging, before his friend, the President, ceases to be controller general. The Honorable Secretary is evidently afraid that his agents will become too acute at detecting adulterations, and injure the revenue by too strict an interpretation of the law, to avoid which, he brings into office physicians from the interior, where the opportunity for making acquaintance with pharmacology and chemistry is necessarily limited.

When the inspectorships of flour, whiskey, bark, etc., are filled with persons ludicrously unfitted for their duties, we can smile and pass on; but when the purity of the drug market is to be periled, that political partizans may be rewarded, it would be criminal to remain quiet.

Outlines of Chemical Analysis, prepared for the Chemical Laboratory of Giessen. By DR. HEINRICH WILL, Professor of Experimental Chemistry in the University of Giessen. *Translated from the third German Edition,* by DANIEL BREED, M.D., of the U. S. Patent Office, and LEWIS H. STERNER, M.A., M.D., Prof. of Chem. Nat. Med. College. Boston and Cambridge, James Monroe & Co., 1855, pp. 297, octavo.

The shortest way to a result that is reliable and accurate, and which does not infer too much pre-existent knowledge on the part of those for whose guidance it is offered, is certainly the one to be chosen for the student. A redundancy of directions and a multiplication of reagents beyond a clear indication of the identity of the objects sought, however important to the toxicological chemist in giving strength and force to an analysis in medico-legal evidence, should always be avoided in presenting practical chemistry to the student, as tending to confuse him. In this regard the teaching of the Giessen school, under the direction of Liebig, was conducted, and its success will not be questioned in view of the many eminent men who have derived their first practical lessons from its laboratory. The work, of which the title page is given above, was prepared at the suggestion of Liebig, by Dr. Will, who, from being his able assistant, has become his successor, since Liebig's translation to the Bavarian Capital, and it has received his unqualified approval. Although the first German edition of this work has already been rendered into English by Prof. Hoffman, of London, and an American edition of this issued under the auspices of Prof. Horsford, of Cambridge,

yet so many changes and improvements are found in the recent German edition that the translators, with the warm approval of the author, have believed a new translation to "be a grateful task, and one sure to benefit scientific research in this country."

In view of the incipient state of practical chemistry in the United States, as a branch of study, the translators have prefixed to the work an introductory chapter on the elements of chemical manipulation, illustrated by figures.

The *first part* is devoted to "the comportment of the metallic oxides and their salts;" the *second* to the comportment of the metalloids and their more important compounds;" the *third*, a "course of qualitative chemical analysis," accompanied by eleven valuable tables, exhibiting the behavior of the several classes of substances with reagents, and before the blow-pipe, so as greatly to facilitate instruction; and the *fourth part*, "outlines of quantitative analysis," is put in the form of forty-one practical examples in quantitative analysis, beginning with simple metallic salts, and successively presenting alloys, minerals, ashes, mineral waters, concludes with a series of organic bodies, and complex animal fluids, as milk and urine.

Of the translators it may be said that they are well qualified for the task. One of them, Dr. Breed, was a student of Leibig, and is favorably known by his discovery of bismethyle and by his translation of Lowig's Elements of Organic Chemistry, and in presenting this new translation they merit the thanks of every American student of analytical chemistry.

The publishers have done their part well; the sheets contain some typographical errors, the most of which have been pointed out in the appended list of corrections, although a few, as will always be the case, have passed unnoticed—for instance, at page 128, six lines from the bottom, the word "nitrogen" should read "oxygen." The TABLES are secured in with muslin strips, and are printed on thicker paper than the text.

Table of Urinary Deposits, with their Microscopical and Chemical Tests, for Clinical Examinations. By JOHN KING, M.D., Cincinnati, Ohio.

This chart is a compilation of the more important characters of healthy and pathological urine, with the appearances exhibited under the microscope of the several normal and abnormal constituents, illustrated by well executed wood cuts; and the usual chemical tests following. Succinct notices of the diseases indicated by the inordinate secretion of normal constituents, as well as those giving rise to the abnormal ingredients, are appended with their remedies. A table of the specific gravities of urine, in reference to the proportion of fluids and solids, and another of the color of different varieties of urine are given.

The whole appears to be carefully arranged, and will prove useful as a reference to the practitioner to refresh his memory, and materially aid the student in getting a clear idea of the subject.

THE
AMERICAN JOURNAL OF PHARMACY.

MAY, 1855.

A SERIOUS MISTAKE IN THE PREPARATION, PROFESSEDLY, OF
MISTURA FERRI COMPOSITA.

By J. T. PLUMMER, M. D., of Richmond, Indiana.

A bottle, purporting to be filled with *Griffith's green draught*," was brought to me, with the information, that the contents vomited the patient violently, a few minutes after she swallowed it; and afterwards purged her: that, nevertheless, she took the second dose at the time prescribed; but as that dose was followed by the same distressing results, even to the rejection of blood, she declined using the medicine, and I was requested to examine it.

The appearance of the preparation was, at first view, so similar to that of this ferruginous mixture, that, as the patient was of delicate habit, I was inclined to attribute the ill effects of it to an exquisite sensitiveness of the stomach to some of the constituents of the compound. All that was obvious to the senses of sight and smelling evinced that the preparation was, as intended to be, *mist. ferri comp.*

The apothecary, who compounded it, on being consulted, said it was "all right."

Having but little time at command, I was not prepared to enter upon so operose an undertaking, even if practicable, as the complete systematic analysis of such a complex compound of organic and mineral matters. I, therefore, proceeded with a course of exclusion, which, fortunately, brought me early to the point at issue. It appeared evident, that in whatever division of the compound the error, if any, was committed, it was by the introduction of an

acid emetic substance. What was there on the shelves of the apothecary, of this poisonous character, likely to be substituted for the proper ingredients of this mixture?

The presence of *myrrh* was too apparent to be denied. The spirit of lavender might be present; but liquor potassæ arsenitis, if substituted, would be accompanied by its constituent compound spt. of lavender. This, however, was not probably the poisonous article, as, by calculation, the patient took less than four minims of this constituent in a dose, and the second dose was taken six hours after the first. But, if the arsenical solution had been mistaken for the rose-water, fifty-six minims would have been swallowed at a dose. In this, however, it was improbable that the error lay, for aside from any assuasive influence, the carbonate of iron, if present in the mixture, would have upon the arsenical poison, the odor of the peppermint water, which was intentionally used instead of rose water, was very distinguishable.

As to the solids in the preparation in question, (carbonate of potash, sugar, and sulphate of iron,) one or more of the salts of antimony, lead and zinc, or arsenious acid, or corrosive sublimate, might have been substituted for them.

By the aid of Trommer's test, I satisfactorily determined the presence of *sugar* in the medical mixture.—By the way, I will state that for the same purpose I tried Donaldson's test, which I prepared in 1852; (Amer. Jour. of Pharm. vol. 24;) but it was not reliable; the results being almost precisely the same in an aqueous solution of *myrrh*, as in the medical preparation. Donaldson's reagent, though very active when recently made, is not a permanent compound.—Sugar, therefore, being present, the apprehended mistake was, in all probability, in respect to the carbonate of potash or sulphate of iron. In one fluid drachm of the medicine, (the dose was only a teaspoonful,) there would be a small fraction over three-tenths of a grain of the chalybeate salt; (exactly .8125 gr;) and less than four-tenths of a grain of the alkaline carbonate. The same quantities of the salts of zinc, lead, or antimony, could hardly produce the pathogenetic effects which the patient experienced; and neither these, nor arsenious acid, or corrosive sublimate would produce, by any reaction with the other constituents of the medical preparation, the bluish

green color of the liquid before me. The salts of copper would. In this case, a carbonate of copper would be formed. Shortly after receiving the "medicine," I poured it into a coarse paper filter. After several days, what did not evaporate, or remain on the filter as a residue, passed through as a pea-green, somewhat turbid fluid. Was this residue on the filter, a carbonate of copper? A portion of it was treated with nitric acid, a very obvious effervescence followed; but the resulting liquid was not of the characteristic color of cupreous salts in solution. Was this owing to the presence of organic matters? Another portion of the residue was, on the affirmative supposition, heated to the charring point, and then subjected to dilute nitric acid: copious effervescence followed. After gently heating the solution, it was filtered: the filtrate was greenish blue, and yielded to ammonia a splendid blue; and to ferrocyanide of potassium an abundant precipitate of a chocolate-brown color. *Copper* was, therefore, unquestionably present in large quantity. What salt of copper was used?

To a portion of the first or turbid filtrate was added solution of chloride of barium; a milky appearance resulted, but even after a long time, no precipitate. To the milky liquid strong nitric acid was added, and the mixture heated. By this means, I was gratified to find, I obtained a precipitate of all the white material, and a transparent, but colored, supernatant fluid; this was decanted, and the precipitate repeatedly washed in the test tube. It was of course, not soluble in nitric acid, which had been added in great excess; nor was it soluble in potash. A *sulphate* was, therefore, clearly indicated; and the conclusion almost, if not wholly unavoidable, that *sulphate of copper* had been introduced into the mixture, instead of sulphate of iron.

On now testing the *turbid* filtrate with ferro-cyanide of potassium, no indications of iron were apparent, but abundant signs of copper were manifest. Ammonia gave no satisfactory results; a bright needle suspended in it for 24 hours, was taken out untarnished; and sulphuretted hydrogen only blackened the filtrate without producing any precipitate after heating and several days repose: thus showing the modifying and opposing influence of the organic matters present, in regard to all these reagents, except the ferro-cyanide of potassium. On acidulating the filtrate, the needle precipitated an abundance of copper.

Thus having detected the presence of this cupreous salt, in large quantity, I did not consider it necessary to prosecute the enquiry any further.

Guy ("Principles of Forensic Medicine,") says truly, that "poisoning with the salts of copper is of very rare occurrence;" and adds: "they are ill adapted to the purposes of the murderer; and, for the same reason, are not likely to be taken accidentally." The reason alluded to, is, of course, the taste and color of these salts; properties so peculiar, that suspicion would be readily excited by them.

It is in reference to this point that the case acquires additional importance; for neither the taste nor color betrayed the poisonous nature of the article swallowed; indeed they rather served to give assurance that no mistake had been committed. *Carbonate* of copper has so near no taste, that were it not for its color, the presence of a cupreous salt would hardly be suspected; and yet in the case before us, the color itself only added to the feeling of security. So that this instance, in which copper was "taken accidentally," furnishes a remarkable exception to the general rule.

The rare occurrence of poisoning by salts of copper, makes it desirable that every example of the kind should find its place on record, until our information on the toxicology of the salts of this metal, is brought nearer to completion. As it is, I find but a solitary case of poisoning by carbonate of copper in any publication which I have examined; and that case is cited by Taylor ("On Poisons,") as occurring in France. So deficient is our knowledge on this subject that no Dispensatory, no treatise on poisons, no medico-legal or other writings consulted, say one word respecting the quantity of carbonate of copper necessary to display deleterious effects. In the case now reported, it is, therefore, of importance to recollect, that, on the supposition that the carbonate was equally diffused through the mixture, *three tenths of a grain* produced twice in the same person violent and prostrating results; and that the admixture of myrrh, sugar, and sulphate of potash, with the cupreous carbonate, did not prevent those results. That all the sulphate of copper was decomposed, is apparent from the inaction of the needle in the turbid filtrate before it was acidulated.

ON GELSEMINUM SEMPERVIRENS.

By M. HENRY KOLLOCK.

*(Extracted from an Inaugural Essay presented to the Philadelphia College of Pharmacy.)*GELSEMINUM SEMPERVIRENS. *Yellow Jessamine. Wild Jessamine. Woodbine.*

SEX. SYST. Pentandria digynia. NAT. ORD. Apocynaceæ.

Terminal flowering branch of *Gelsemium sempervirens*.

History.—"This plant, the *Bignonia nitidum* of Michaux and Pursh, has a smooth, twining, glabrous stem, with leaves dark green above, paler beneath, entire, lanceolate, perennial and opposite; short petioles, and bears yellow flowers having an agreeable but rather narcotic odor."

"*Gelseminum*, (Jussieu.) Carolina Jessamine. Calx five-leaved, very small. Corolla funnel form, border spreading, five-lobed, nearly equal. Capsule compressed and flat, bipartite, bilocular. Seed flat, attached to the margins of the valves.

A twining evergreen shrub, not lactescent, leaves opposite; flowers in small axillary and terminal fascicles, yellow; calix subtended by imbricated gemmaceous bractes.

Species.—1st, *G. nitidum*. Flowers fragrant, anthers oblong sagittate; style short, bifid; stigmas linear, oblong, bilobed, pubescent. 2d, *G. inodorum*. Calix, leaves obtuse; flowers inodorous. Near Savannah, in Georgia.—"*Nuttall's Genera of North American Plants*."

"The yellow jessamine is often planted against walls, pales, &c., as the branches are weak and slender, and it will grow to ten or twelve feet high, if thus supported. The young shoots are of a fine strong green color, angular and a little hairy. The leaves are trifoliate, though sometimes they grow singly. They are placed alternately upon the branches, are of a thick consistence, smooth, and of a fine deep green color. The flowers are yellow, and do not possess the fragrance of the common jessamine. They are produced early in June, and the blow is soon over; they are succeeded by berries, which, when ripe, are black. Although this shrub possess a certain stiffness, which gives it somewhat the appearance of an artificial flower, yet the fine yellow color of its blossoms contrasts so well with the rich green of the foliage, that in the flower-pot or the bouquet it never fails to have a conspicuous and pleasing effect."—*Jay's Botany*.

The *Gelseminum* has been known for many years in domestic practice, both in the south and west, as a vermifuge; and generally used in the form of an infusion made from the roots. Having attracted considerable attention as a febrifuge, in consequence of the statements made by Eclectic physicians and others, it seemed desirable that an examination of its chemical constituents should be instituted, and, if possible, the active principle be isolated. "The plant was brought into notice as a febrifuge, as far as we can learn, in the following manner. A planter having been laboring under a severe attack of intermittent fever, which seemed to resist all remedies, requested one of his servants to collect a common root growing

in his garden, and prepare an infusion of it for him to drink. The servant by mistake collected another root, and gave a tea of it to his master, who, shortly after swallowing some of it, was seized with a complete loss of muscular power, and general prostration of the system; unable to move a limb or even to raise his eye-lids, although he could hear and was cognizant of circumstances transpiring around him, his friends collected, expecting every minute to see him breathe his last. After some hours, he gradually recovered himself, and was astonished to find that his fever had left him. Ascertaining from his servant what plant it was that acted in this manner, he collected some of it, and employed it successfully on his own plantation, as well as among his neighbors. The success of this article finally reached the ears of a physician, who prepared from it a nostrum called "Electrical Febrifuge," which was disguised with the essence of wintergreen."

Chemical examination.—Two ounces of the bruised root was macerated in cold water for twenty-four hours, then placed in a displacement apparatus, and half a pint of liquid obtained. This was of a bright red color, similar to Lisbon wine, possessing the disagreeable and strong peculiar odor of the plant.

To a portion of the above infusion, a small quantity of a solution of tannic acid was added, drop by drop, which caused a cloudy precipitate. Another portion of the solution was boiled for about five minutes, which became cloudy after standing. Lastly, a solution of corrosive sublimate was dropped into a fresh portion of the infusion, which again caused a precipitate. It may be noticed that the presence of malic, phosphoric or acetic acids, will prevent the last named test from being decided; this should be obviated by treating either with an alkali or alkaline carbonate, (ammonia, excepted.) From the above, we may conclude that *albumen* exists in considerable quantity.

The muriated tincture of iron yielded a greenish precipitate, indicating tannic or gallic acid; but as the solutions of gelatin and sulphate of the protoxide of iron produced no change, it was inferred that *gallic acid* alone was present.

The dregs remaining in the displacement filter from preparing the infusion, were next boiled in water for about fifteen minutes, and allowed to cool. To the filtered decoction, a few drops of

the tincture of iodine were added, which produced a fine blue color, which disappeared upon the application of heat, evidencing *starch* to be one of its constituents.

The solution of subacetate of lead produced a curdy precipitate, indicating the presence of *gum*.

Two ounces of the root were exhausted with cold water, and then washed with a solution of carbonate of soda, which removed considerable coloring matter. The filtrate was treated with dilute muriatic acid, which caused a copious precipitate soluble in dilute acetic acid, thus demonstrating *pectic acid* to enter into its constitution.

One ounce of the finely powdered root was displaced with ether, to exhaustion, after twenty-four hours maceration. The tincture thus obtained was of a dark green color, and yielded upon evaporation twenty-one grains of a green resin, resembling the resin of the *Cannabis indica*, (Indian Hemp.) This was insoluble in water, slightly so in alcohol, and possessing the peculiar bitter taste of the drug. Thus showing *fatty resin*.

A small quantity of a tincture made with strong alcohol ($.809^{\circ}$) was evaporated to dryness, and the residue laid upon filtering paper, to which it communicated a greasy stain, which did not disappear upon the application of heat; a *fixed oil* was thus proven to exist in it.

A tincture was made by exhausting two ounces of the bruised root by displacement with eight fluidounces of alcohol, $.835^{\circ}$. The filtered liquor was of a reddish brown color, and of an intensely bitter taste. One half of this was evaporated to dryness, which yielded a fine garnet colored extract, partially soluble in water and ether. The other half was evaporated to a syrupy consistence and thrown upon a quantity of water, which caused the resin to be precipitated in the form of a yellow powder; this was re-dissolved in alcohol $.835^{\circ}$, and some animal charcoal was added; it was then boiled after maceration for twenty-four hours; the solution being colorless, was again thrown upon a quantity of water, by which the resin was precipitated in the form of a colorless powder; it was then collected by decantation and filtration, and when powdered, it resembled powdered tannic acid. To this product, the Eclectic Association have appended the name of "*Gelsemin*," alleging that it is the active principle. By these

experiments, we may infer that *dry acrid resin* is one of its constituents.

The waters into which the evaporated tinctures were thrown, in the above experiment, after the resin had subsided, were evaporated to dryness. The resulting extract possessed the taste and odor of the drug. This was dried upon glass, and a small quantity was thus obtained in the form of scales of a very fine garnet color, very soluble in water, to which menstruum it imparted a brilliant yellow color. *Yellow coloring matter* is consequently, also, one of its constituents.

Two thousand grains of the bruised root were distilled with a saturated solution of chloride of sodium. The distillate was quite milky, when to my surprise, the oil, instead of floating upon the surface, quickly sunk to the bottom of the receiver; thus evidently showing a specific gravity unusual for volatile oils. I did not succeed in obtaining the exact specific gravity of this oil, owing to the difficulty in operating upon such small quantities at a time. This quantity of root yielded about ten minims of oil free from water, the water of course holding some in solution. The oil has the odor of the plant to a considerable extent, if the distillation is conducted at a low heat; if the heat is raised, however, the oil is very liable to become empyreumatic. A heavy *volatile oil* is clearly shown to exist.

Five thousand grains of the bruised root were macerated for twenty-four hours in sufficient cold water to cover it. After the root had become thoroughly saturated with moisture, it was transferred to a displacement apparatus, and cold water allowed to percolate slowly, till the mass was exhausted. This liquid was evaporated upon a water bath to one pint, and filtered to separate the coagulated albumen, and oxygenated matters that had precipitated. It was again carefully evaporated to dryness, yielding a deep brown extract, weighing nine hundred and thirty grains. *Extractive matter* soluble in water, also forms a part of the constituents.

Investigation of the Aqueous Extract.—The aqueous extract possessed the peculiar bitter taste and odor of the plant. It was perfectly soluble in cold water, sparingly so in cold alcohol, but boiling alcohol dissolved about one half. The solutions all showed the presence of an acid by litmus paper, and were more or less colored.

The portion taken up by the alcohol evaporated to dryness, yielding a garnet colored extract of intense bitterness, far surpassing that of the other half. It dissolves readily in cold water.

One hundred grains of the aqueous extract were dissolved in four fluidounces of water, and the solution treated with the solution of the subacetate of lead, until it ceased to produce a precipitate. This was separated by filtration, and the liquid portion submitted to a stream of sulphuretted hydrogen, to eliminate the lead. The supernatant liquor was then evaporated to dryness, in order to get rid of the excess of sulphuretted hydrogen and the acetic acid left by the decomposition of the salt of lead. The extract thus obtained, treated with boiling alcohol and filtered while hot, yielded, upon cooling, a small quantity of crystals, similar in appearance to the sulphate of quinine, and having a very bitter taste. These crystals, which I will call *Acetate of Gelseminia*, were in too small a quantity for me to examine as I wished, nor as I would have done had there been a larger quantity.

An alcoholic extract was made from the powdered root in a displacement apparatus with alcohol .809°. The product was of a brownish color, translucent in thin lamina, and of an intensely bitter taste.

Investigation of the Alcoholic Extract.—One hundred grains of the alcoholic extract were treated with half an ounce of distilled water, acidulated with acetic acid, and heated to about 100° F., a little animal charcoal being added. To the liquor, filtered and partially neutralized by ammonia, a fresh concentrated infusion of galls was gradually added, as long as a precipitate was produced. This precipitate which was tannate of gelseminia, was obtained separate by decanting the liquor; this was then washed with distilled water, mixed with a little alcohol, and then rubbed in a mortar with one-third of very finely powdered litharge. The mixture was heated gently, and submitted to the action of twice its volume of alcohol at about 90° F. The alcoholic solution was then treated with a little animal charcoal, filtered and evaporated at a very gentle heat. The residuum was acted upon twice with cold ether, which removed all impurities, and left the gelseminia in an amorphous state. I did not succeed

in crystallizing it. This substance was white, inodorous and of intense bitterness.

A piece of litmus paper was moistened with a very dilute solution of muriatic acid, which changed the original blue color of the paper to a light red; upon this paper, while yet moist, was laid a very small quantity of the amorphous powder, which instantly restored the blue color to that part of the paper upon which it was placed. Thus evidently showing that this substance is an alkaloid, and, therefore, may properly be called *Gelseminia*.

Examination of the Ashes.—Four hundred and eighty grains of the powdered Jessamine root yielded upon combustion in a platinum crucible, eighteen grains of ashes.

By treatment with water, carbonate and sulphate of potassa were dissolved out. The insoluble residue, after treatment with muriatic acid, left a silicious residue, whilst the acid solution contained salts of iron, lime and magnesia.

The foregoing experiments show that the root of the *Gelseminum sempervirens* contains *Albumen, Gallic Acid, Starch, Gum, Pectic Acid, Fatty Resin, Fixed Oil, Dry Acrid Resin, Yellow Coloring Matter, Volatile Oil, Extractive Matter, Lignin, Gelseminia*, (a peculiar alkaloid;) *Salts of Potassa, Lime, Magnesia, Iron and Silica*.

The leaves and blossoms, from the few experiments I have been able to institute with them, contain the same ingredients, but in much smaller quantities.

Owing to the difficulty of obtaining the root, and its real scarcity, my experiments in isolating the active principle have not been carried out as far as was desirable; reserving this as a basis for a future paper, I shall simply say in conclusion, that it has been out of my power to experiment with the *Gelseminia*. This I sincerely hope some one will undertake whose opportunities are more favorable to success than mine are.

September 7th, 1854.

[NOTE.—It is to be regretted that Mr. Kollock did not have the acrid resin (*Gelsemin*), the alkaloid *Gelseminia*, and the volatile oil, tried in reference to their medicinal activity. The well known power of hemp resin (*Cannabin*.) should, at least, induce a trial before deciding this to be inert. If *Gelseminia* is the active principle, it must necessarily be a powerful and interesting substance, worthy of the notice of the experimental therapist. The engraving was drawn by the artist from a specimen of the plant.—Ed.]

EXAMINATION OF BITARTRATE OF POTASSA.

BY JOHN M. MAISCHE.

In a former paper I have pointed out the necessity and importance of subjecting the commercial drugs and chemicals to an analysis, at least so far as those impurities and adulterations are concerned, that are common to the substances in question. Cream of tartar is among those articles which at present command a very high price, and to the adulteration of which, it might seem, there is much inducement. Tartrate of lime $2\text{CaO}, \text{C}_8 \text{H}_4 \text{O}_{10} + 8\text{HO}$ is always to be found in the commercial cream of tartar, and can not wholly be separated from it, as it is soluble in water, requiring about 600 parts of boiling water to effect its solution. As cream of tartar is dissolved by about 15 parts of boiling water, it is obvious, that the best article of it will still contain about 3 per cent. of the lime salt. Besides this, cream of tartar sometimes contains copper, from the copper vessels in which it had been purified.

The best way to find these impurities, is by incineration in a crucible, and extracting the residue with hydrochloric acid, when the chlorides of potassium, calcium, &c., will be dissolved; from the solution, copper will be precipitated by hydrosulphuric acid. Five specimens which I have analysed were free of copper, and I determined the quantity of tartrate of lime by adding ammonia in excess to the acid solution, precipitating the lime by oxalate of ammonia, and heating the obtained oxalate of lime carefully, in order to destroy the oxalic acid without expelling any carbonic acid.

Of two specimens, the quantity of lime was determined by dissolving the obtained chloride of calcium in alcohol, and adding sulphuric acid diluted with some water, which will precipitate the lime as sulphate; this, after separation and washing with alcohol, was heated so as to leave the anhydrous sulphate of lime, CaO SO_3 .

From the weight of the obtained carbonate and sulphate of lime, the amount of tartrate of lime was calculated in accordance with the following weights of equivalent:

CaO, CO_2 50, CaO, SO_3 68, $2 \text{CaO}, \text{C}_8 \text{H}_4 \text{O}_{10} + 8 \text{HO}$ 260.

In every instance, I have used 240 grs. of cream of tartar, from which I had the following results :

I.	11 grs	CaO, CO ₂	corresponding with	28.6 gr. or	11.92 p. ct.	$\left. \begin{array}{l} \text{Tartrate of lime,} \\ 2 \text{ CaO, C}_6 \text{ H}_4 \\ \text{O}_8 + 8 \text{HO.} \end{array} \right\}$
II.	6 "	"	"	15.6 "	6.08 "	
III.	10 "	"	"	26.0 "	10.83 "	
IV.	12 "	CaO, SO ₄	"	22.94 "	9.56 "	
V.	17 "	"	"	32.5 "	13.54 "	

In conclusion, I may remark that specimen I. was of a beautiful white color, inferring the supposition that it had been prepared with much care and would be found very free of lime.

Philadelphia, March, 1855.

ON CORYDALIS FORMOSA—(OR TURKEY CORN.)

By WILLIAM T. WENZELL.

(An Inaugural Essay presented to the Philadelphia College of Pharmacy.)

CORYDALIS FORMOSA.

SEX. SYST. *Diadelphia pentandria*. NAT. ORD. *Fumariacæ*.

This plant, likewise known as the wild Turkey Pea, Staggerweed, or Choice Dielytra, is an indigenous perennial plant of small stature, its height varying from six to ten inches, rising from a tuberous root. The leaves are radical, somewhat triternate, with incisely pinnatifid segments and very glaucous beneath. The scape is naked and rises from eight to ten inches in height, with four to six cymes, each with from six to ten reddish purple nodding flowers. Racemes compound, the branches cymose; spurs two, short, obtuse incurved, bracts purplish; sepals two, deciduous, style exserted; stigma two horned at the apex, capsule pod-shaped, indehiscent, two-valved and many seeded.—(*Eclectic Dispensatory*.)

This beautiful little plant flowers very early in the spring. It grows in rich soils on hills and mountains, among rocks and old decayed timber, is found westward, and south of New York to North Carolina. The root or tuber is the only part of the plant medicinally employed. Its appearance is that of a small round ball, sometimes more or less angular, its superior and inferior extremities somewhat depressed. Externally smooth, but when examined with a good lens, exhibiting numerous pores, color varying from a yellowish gray to a dark brown. Internally its color ranges from a light to a dark yellow, according to the age of the

specimen under examination, and mode of desiccation. Its fracture is hard, rough and uneven, presenting numerous glistening points. The powder presents a brownish yellow color, and communicates a harsh and starchy feel, when rubbed or pressed between the fingers. It has a faint peculiar odor, taste at first slightly bitter, succeeded by one peculiarly persistent and somewhat penetrating, influencing the fauces and increasing the flow of saliva. It yields its virtues to water and alcohol.

Course of Analysis.—The powdered root subjected to the action of sulphuric ether in a percolator, until the ether passes perfectly colorless, formed a yellowish brown solution, which left, on spontaneous evaporation, a brown black substance, having the consistence of a soft extract, dissolving nearly entirely in alcohol. This alcoholic solution was precipitated by an alcoholic solution of acetate of lead, as also by admixture with water, and by evaporation, left a resinous mass very acrid and persistent to the taste and aromatic in odor. It easily fused when heated; on raising the heat, dense white fumes were given off, and on still further increasing the temperature it took fire, burning with a black smoke, leaving a light voluminous coal.

II. The powder, after the above exhaustion, was again introduced into a percolator and alcohol (.825) poured into it. The displaced liquid exhibited a deep brownish yellow color and bitter taste. On evaporating in a water bath, adding occasionally water to replace the alcohol volatilized during the process, a resinous matter separated which was soluble in alcohol, but insoluble in ether. The liquid separated from the resin by filtration gave the following reactions. Tincture of galls, solutions of alkalies and their carbonates, gave precipitates, which were re-dissolved on the addition of acetic acid, as also in strong alcohol. A portion of the washed precipitate [by the alkaline solution] placed on litmus paper, previously reddened by extremely dilute acetic acid, instantly restored its blue color. Acetate of lead gave a precipitate soluble in dilute nitric acid.

III. The powdered root after the two previous exhaustions and subsequent drying, was now subjected to the action of cold water. The displaced liquid obtained, possessed a brown color and slight bitter taste, gave precipitates with acetate of lead and protochloride of tin. Subacetate of lead gave, after the action

of the neutral acetate, a white voluminous flocculent precipitate. By heating to ebullition, at the same time adding a few drops of nitric acid, coagulated albumen subsided. On evaporation, the liquid left a brown soft substance possessing adhesive properties.

IV. The powder left after the preceding watery exhaustion, was treated with boiling water until all the starchy matter was removed, as indicated by the action of tincture of iodine on a portion of the washings, boiled and allowed to cool before adding the test.

The cortical portion, cellular substance, &c., thus left, was then treated by continued boiling with water. The filtrate gave a voluminous, white and flocculent precipitate with subacetate of lead, and left a gummy mass on evaporation.

V. The following process was employed for the isolation of the alkaloid. A hydro-alcoholic tincture was evaporated to the expulsion of alcohol, and the resin separated by filtration. To the filtrate, ammonia was added to a slight excess, and the yellow precipitate collected on a filter. The washed precipitate subjected to the action of boiling alcohol, which dissolved the alkaloid, but left a residue, which, on examination, proved to be a mixture of hydrate of magnesia and brown coloring matter. The alcoholic solution was now evaporated to dryness, and the residue treated with dilute hydrochloric acid, when the alkaloid was taken up and an additional quantity of resin left. The muriated solution was precipitated by ammonia, the precipitate dissolved in boiling alcohol and concentrated, when, after a few hours repose, a crystalline compound was deposited. This purified by two or three crystallizations, crystallizes from concentrated alcoholic solutions and by slow evaporation in beautiful, minute, transparent, colorless, slender, four-sided prisms, arranged in tufts or interlacing to form stellar groups, contaminated with adhering yellow bitter extractive, from which they are separated with great difficulty. They are inalterable in air, tasteless and inodorous, very soluble in alcohol, ether and chloroform, but insoluble in water. They are decomposed by concentrated nitric acid with the production of a red color. They form salts with acids very soluble in water. The acetate crystallizes in transparent colorless prisms. The sulphate forms an amorphous scarcely crystalline mass; the hydro-chlorate in uncrystallizable.

They yield with bi-chloride of mercury an insoluble double salt. The soluble salts are precipitated by alkaline iodides, bromides and ferrocyanides, as insoluble compounds.

From the above statements it will appear that the alkaloid is identical with that described by European chemists, obtained from the *Corydalis bulbosa* and *Corydalis fabacea*, plants analogous in their botanical characters to our own indigenous plant, the *Corydalis formosa*.

VI. The filtrate left in the preceding article after the first precipitation with ammonia, was heated to expel the ammonia, and mixed with a solution of acetate of lead. The precipitate washed and decomposed with dilute sulphuric acid and filtered, the filtrate again precipitated by acetate of lead and decomposed by a current of hydro-sulphuric acid gas, heated to expel the latter, and finally decolorized by passing through prepared animal charcoal. The acid solution thus obtained reddened litmus paper very strongly, and possessed an agreeable acid taste. On testing with solutions of chloride of barium and calcium, barytic and lime waters, no precipitates were obtained.

A portion of the acid solution evaporated to dryness, sublimed with residue, and when boiled with concentrated nitric acid no decomposed ensued. On neutralizing with ammonia and adding chloride of calcium, no precipitate occurred until heating to ebullition. Acetate of lead gave a white voluminous precipitate insoluble in acetic acid and ammonia, but soluble in dilute nitric acid; on heating in water it did not perceptibly change.

Nitrate of silver produced a white precipitate, which did not undergo any alteration in cold or boiling water, even after standing some time.

Sulphate of copper added and heated, a greenish blue crystalline precipitate subsided. Tincture of sesquichloride of iron added and gently heated, a dirty yellow voluminous precipitate immediately subsided. Proto-chloride of manganese reacted similarly to the preceding; a dirty white flocculent precipitate appeared. The acid under examination was, therefore, fumaric acid, a peculiar acid found likewise to be a constituent of the *Fumaria officinalis*, a plant belonging to the same natural order of plants. In the present course of analysis, I have only stated those reactions of a positive character, neglecting to take note of

such giving negative indications, in order to avoid minutiae. To give a summary view of the last subject, setting forth its properties and behaviour towards chemical tests, individually and in relation to other known organic acids for the purpose of establishing its identity, the following will perhaps prove how far the results may be from being correct :

Malic Acid is precipitated by barytic water, while fumaric acid is not. A neutral alkaline malate forms a precipitate with nitrate of silver, which changes after a time into colorless transparent crystals. Fumaric acid forms, under similar circumstances, a white precipitate which does not change.

Malic Acid resembles fumaric in the behaviour of alkaline fumarates towards chloride of calcium, both heated on mixing to ebullition. But differs from it in its compound of oxide of lead, which, in the former, melts in hot water, forming a mass of a pitchy consistence; while the latter does not change or melt. Again, the fumarate of copper is insoluble, while the malate crystallizes.

Citric acid. An alkaline citrate is immediately precipitated in the cold by chloride of barium and calcium, while an alkaline fumarate gives no precipitate with the same reagent under similar circumstances.

Tartaric, racemic and oxalic acids resemble fumaric in its behaviour toward solution of gypsum, but differ from fumaric acid in their action upon lime water.

Succinic acid differs from fumaric acid by its salt of protoxide of manganese, which crystallizes, while the fumarate is insoluble. In its salt of zinc, which is very insoluble while the fumarate crystallizes. It resembles fumaric acid by an alkaline succinate producing an insoluble precipitate with persalts of iron, somewhat similar to that obtained by an alkaline fumarate.

Formic acid differs from fumaric by its behaviour towards persalts of mercury and silver which are reduced.

Acetic acid differs from fumaric acid by its salts of protoxide of copper and manganese, which are very soluble.

VII. *Determination of inorganic constituents.* The remaining liquid after the precipitation of the organic acid, and the solution deprived of its excess of lead by hydro-sulphuric acid gas was concentrated and filtered. The solution gave with tartaric acid in excess, a precipitate of bi-tartrate of potassa. Oxalate of ammonia, the white pulverulent precipitate of oxalate of lime. The powdered root, after exhaustion with dilute alcohol on incineration, gave a considerable amount of ashes, which effervesced strongly on dissolving in hydrochloric acid. Evaporated to dryness and dissolved in distilled water, the filtered solution gave, with oxalate of ammonia, a precipitate of oxalate of lime; by the addition of ammonia, the gelatinous hydrate of alumina; with ferrocyanide of potassium, a blue precipitate. A

portion of the gritty residuum, after the action of hydrochloric acid, on being heated with borax in the oxidation flame before the blowpipe, formed a bead communicating a purple tinge, which completely disappeared on exposure to the reduction flame, indicating the presence of peroxide of manganese. Another portion treated with a boiling solution of potassa, then diluted and filtered, on saturating with hydrochloric acid, a gelatinous flocculent precipitate of hydrated silicic acid subsided. The part left untouched, both by hydrochloric acid and solution of potassa, presented small angular crystals, which, when fused with pure potassa, formed a compound readily soluble in water, and precipitated hydrated silicic acid on saturation with hydrochloric acid.

From the foregoing experiments, therefore, the bulb of the *Corydalis formosa* may be said to contain the following organic and inorganic constituents :

ORGANIC SUBSTANCES.

Corydalia.	Brown coloring matter.
Fumaric acid.	Starch.
Yellow bitter extractive.	Albumen.
Acrid resin soluble in alcohol and ether, containing volatile oil.	Arabin or soluble gum.
Tasteless resin soluble in alcohol, and insoluble in ether.	Bassorin or insoluble gum.
	Cellulose and cortical substance.

INORGANIC SUBSTANCES.

Soluble.

Salts of potassa.	Salts of magnesia.
" " lime.	

Insoluble.

Carbonate of lime.	Protoxide of manganese, (a trace.)
Alumina.	Hydrate silicic acid.
Sesquioxide of iron.	Silicious sand.

Medical Properties and Uses.—*Corydalis* is considered tonic, diuretic and alterative. In syphilitic affections it is thought by Eclectic practitioners to be the best remedy they possess for that peculiar complaint, and they speak with confidence of its efficacy, ascribing to it almost magical powers. It is also deemed valuable in the treatment of scrofula, and particularly diseases of a cutaneous character. As a tonic, its properties are similar to

the pure bitters. As an alterative, it is spoken of as a remedy of great value. Here, then, we have a medicine uniting three important properties of remedial agents, that of the tonic, diuretic and alterative, and must, if true and successful in standing the test of practice, give us a remedy of no mean value as the future may determine. Dose of the powdered bulb ten to thirty grains. Formula for a tincture and decoction are given in the Eclectic Dispensatory, as also one for the alkaloid "Corydalia," but the substance it produces is nothing more or less than a mixture of corydalia, resin, bitter extractive, hydrate of magnesia and coloring matter, and is administered in one grain doses.

As the pure alkaloid is tasteless and does not seem to possess any sensible medical properties, I may, in truth, state that Corydalia is inert; and the medicinal properties of the plant (if any,) must reside in resin and bitter extractive, and, perhaps, volatile oil.

ON THE TINCTURE OF MURIATE OF IRON.

BY ALONZO CALDWELL.

Since the official introduction of tincture of muriate of iron by the U. S. Pharmacopœia, several attempts have been made to obtain a more certain formula than that originally proposed.

According to the U. S. Dispensatory the preparation often varies from 18 to 40 grains of sesqui-oxide of iron to the fluid ounce—which of course is a matter of great consideration, the standard strength being $32\frac{1}{2}$ grains.

The failure is no doubt attributable as often to the sub-carbonate of iron as to the muriatic acid employed, it being difficult to dissolve in that acid, especially when old, or dried at too high a temperature. The following plan, I think, will obviate all difficulties, and yield a tincture always of the same strength. It is worthy, at least, of a trial, as it can be made in a few minutes:—

R. Hydrated sesqui-oxide of iron (in form of magma)	℥xii.
Acid muriatic,	℥vij.
Alcohol,	℥iss.

Boil the hydrated oxide with the acid, in a glass or porcelain vessel, for 15 minutes, add the alcohol, and filter. This tincture yields 85 grains of the dry oxide to the fluid ounce.

Baltimore, March, 1855.

NOTE BY THE EDITOR.—In our last number we published a paper on this subject from Mr. A. P. Sharp, of Baltimore, who suggested that the irregular, and too often deficient strength of this preparation, was due to the commercial acid, which was not so strong as the official. To remedy this difficulty, he proposed to pass muriatic acid gas into the mixture of acid and subcarbonate until the solution is perfect.

Mr. H. W. Fuller, pharmacist, of Bangor, Maine, in a letter to the editor, remarks, in reference to Mr. Sharp's suggestion, "would it not be an improvement on his process to avoid the application of heat to the mixture, (as in the U. S. P.) and to surround the solution with refrigerants while passing into it the hydrochloric acid gas," so as to favor its absorption?

Now, Mr. Caldwell aims at remedying the original difficulty by the use of hydrated sesqui-oxide of iron in the state of magma, so as to effect the saturation of the acid at once. At first view this appears a good suggestion, but on examination it will be found obnoxious to several criticisms. 1st. The magma of hydrated sesqui-oxide is by no means uniform in its state of hydration, consequently, a given weight does not represent a constant quantity of iron. 2nd. Muriatic acid, as has been shown by Mr. Sharp, cannot be depended upon for strength, and as Mr. Caldwell's process does not control the strength of the acid, this is another objection. 3d. Admitting that the quantity of hydrated oxide prescribed should really be correct, yet a deficiency of acid would still be able to dissolve all the oxide, owing to the formation of oxy-chloride when sesqui-chloride in solution is digested with hydrated sesqui-oxide. Indeed, when a solution of one equivalent of sesqui-chloride is digested till saturated with the oxide, the relation of oxide to chloride is, according to Gmelin, $14\text{Fe}^{\text{O}}\text{O}^3 + \text{Fe}^{\text{O}}\text{Cl}^3$.

Further; in regard to Mr. Sharp's method, it may be proper to suggest that it is liable, in inexperienced hands, to give an excess of acid, (and this is especially the case if Mr. Fuller's suggestion is adopted, to refrigerate the liquid before passing in the gas,) as the solubility of this gas in water is so great, that it will be absorbed more rapidly than it will combine with the undissolved oxide. We usually overcome the difficulty arising from a deficiency in the strength of the acid by adding more liquid muriatic acid, until (with the application of a moderate heat) the solution is effected. This plan increases the proportion of water slightly, as less alcohol is needed to make up the measure.

NOTE ON THE NOMENCLATURE OF SALTS.

BY FRANKLIN BACHE, M. D.'

To the Editor of the American Journal of Pharmacy :

In the number for March, 1855, of your Journal, you have published some remarks, by Dr. J. C. Morris, on the nomenclature of salts. The writer advocates the plan of naming them on what may be called the *neutrality principle*. In many neutral salts there is one equivalent of acid for every equivalent of oxygen in the base. This relation is shown in the two salts, severally expressed by the formulæ, FeO, SO_3 , and $\text{Fe}_2\text{O}_3, 3\text{SO}_3$. But this relation of the acid to the oxygen of the base does not always indicate a neutral salt; for it exists in carbonate of potassa (KO, CO_2) which is an alkaline salt. Again, in borax ($\text{NaO}, 2\text{BO}_3$) there are two equivalents of acid to one equivalent of oxygen in the base, and, with this large proportion of acid, the salt is still alkaline. In relation to this salt Fownes says, "Although by constitution an acid salt, borax has an alkaline reaction to test paper." This is as much as to say, "Although in theory borax is an acid salt, yet in fact it is an alkaline one." Would it not be better to abandon this notion of the constitutional acidity or neutrality of a salt, when it is in so many instances contradicted by the fact?

But, waiving all objections to the principle of a conventional neutrality, founded on the constitution of the salt, irrespective of its reaction with test-paper, it may be useful to inquire, what are the advantages of a nomenclature for salts, based on this principle. In the paper above referred to, it is contended that the generic name, representing the acid in a set of salts having a common acid, must, in all the neutral salts, irrespective of the number of equivalents of acid present, be used without prefix, indicating the number of these equivalents. Thus, in the case of the neutral salts, formed by the union of sulphuric acid with protoxide and sesquioxide of iron respectively (FeO, SO_3 , and $\text{Fe}_2\text{O}_3, 3\text{SO}_3$), it is contended by the writer of the paper, that the correct names are sulphate of protoxide of iron, and sulphate of sesquioxide of iron; or (indicating the stage of oxidation of the metal of the base by a prefix) protosulphate of iron, and sesquisulphate of iron.

The principle of nomenclature which will be advocated in this

note, is that which represents the equivalent composition, or supposed equivalent composition of a salt, as expressed in its formula, by its name. In this way a picture, as it were, of its formula is presented; and any prefix, denoting a plurality of equivalents of acid in a salt, is not to be taken as indicating in any manner its reaction, whether neutral, acid, or alkaline. According to this plan, the salts, represented by the formulæ, FeO, SO_3 , and $\text{Fe}_2\text{O}_3, 3\text{SO}_3$, may be called monosulphate of protoxide of iron, and tersulphate of sesquioxide of iron.

Here an incidental question may be noticed; namely, the question of the proper way of indicating the stage of oxidation of the metal of the base, where two oxides of the same metal are salifiable. The prevalent nomenclature, in this case, is to prefix to the name of the salt, syllables indicating the grade of oxidation of the metal. Thus, green vitriol (FeO, SO_3) is called protosulphate of iron. Here the prefix, proto, indicates the grade of oxidation of the iron; and yet it is placed as far off as possible from the word iron, to which it relates. If a chemist were restricted to these precise syllables to express green vitriol, it would be more perspicuous for him to say sulphate of proto-iron, prefixing the syllables, proto, to the word they are intended to affect. This change of nomenclature, however, is not advocated; but it is contended that the full name should be used, sacrificing brevity to clearness, and that the salt should be called sulphate of protoxide of iron.

The nomenclature of salts, here advocated, may be called naming them on the *equivalent-composition principle*. The adoption of it requires that the generic name of the salt should be without any prefix having relation to the base. When the generic name receives any prefix, it should denote the number of equivalents of acid. It is evidently confusing to use two prefixes, one relating to the acid, the other to the base. If a salt having the formula, $\text{FeO}, 2\text{SO}_3$, were discovered, the writer commented on would probably call it biprotosulphate of iron; and if we had no single word (potassa) to express protoxide of potassium, then $\text{KO}, 2\text{CO}_2$, on the same principle of nomenclature, would be called by him biprotocarbonate of potassium. On the principle of nomenclature, advocated in this note, it would be named bicarbonate of protoxide of potassium.

In judging of the comparative merits of the nomenclature of salts on the neutrality principle, and on the equivalent-composition principle, the question of the propriety or non-propriety of prefixes relating to the base, is not necessarily involved; but, as the writer, on whose remarks this note is a comment, is willing to use such prefixes, they will be employed in expressing the nomenclature he advocates, in the comparative view given below.

Two sulphates of iron (FeO, SO_3 , and $\text{Fe}_2\text{O}_3, 3\text{SO}_3$). The names of these salts on the neutrality principle are protosulphate of iron and sesquisulphate of iron; on the equivalent-composition principle, monosulphate of protoxide of iron and tersulphate of sesquioxide of iron. In the two names, here objected to, the word "sulphate" means, first, one equivalent of sulphuric acid, and, afterwards, three equivalents of sulphuric acid. The adept, it is true, can analyze the name, "sesquisulphate of iron." He may say, "sesqui" means that there are three equivalents of oxygen in the base, united with two of iron; and for each of these equivalents of oxygen, there must be one equivalent of acid, that is, three equivalents altogether. In the other name for the same salt, the prefix, ter, relates to the acid, and denotes that three equivalents of acid are present, without depending on a correct inference being drawn that three are present, from knowing the stage of oxidation of the metal. The prefix, mono, given above, is not strictly necessary; but it is better to use it, when, as in this case, two salts of the same metal are in question, containing, severally, one equivalent and more than one equivalent of the same acid. In expressing nitre (KO, NO_3), there would be no motive for saying mononitrate of potassa; because no higher nitrate of this alkali is known.

Salt having the formula, $\text{Fe}_2\text{O}_3, 3\text{NO}_3$. The name of this salt on the neutrality principle is sesquinitrate of iron; on the equivalent-composition principle, ternitrate of sesquioxide of iron.

*Salt having the formula, $\text{HgO}_2, 2\text{SO}_3$.** The name of this salt on the neutrality principle is deutosulphate of mercury; on the equivalent-composition principle, bisulphate of deutoxide of mercury. The salt having the formula, $\text{HgO}_2, 4\text{SO}_3$, if it existed,

* The old number for the equivalent of mercury is here assumed, and not the old number divided by two.

would, on the neutrality principle, be called bidentosulphate of mercury; on the equivalent-composition principle, quadrisulphate of deutoxide of mercury.

Salt having the formula, $\text{FeO}_3, 8\text{NO}_6$. The name of this salt on the neutrality principle is ternitrate of iron; on the equivalent-composition principle, ternitrate of teroxide of iron. In the paper commented on, it is alleged that the nomenclature objected to, which is that advocated in this note, would lead almost inevitably to the confounding the salts, expressed by the formulæ, $\text{FeO}_3, 8\text{NO}_6$, and $\text{Fe}_2\text{O}_3, 8\text{NO}_6$. Now, according to the nomenclature advocated in this note, these salts would have names sufficiently distinct; for the former would be called ternitrate of teroxide of iron, and the latter, ternitrate of sesquioxide of iron. On the neutrality principle, they would be called ternitrate of iron, and sesquinirate of iron. Here it is seen that the word, ternitrate, is used in different senses, according as the one or the other plan of nomenclature is adopted; but it may be asked whether, in these nitrates, the prefix, ter, is not more appropriate to mean three equivalents of nitric acid, than to mean three equivalents of oxygen, united with one equivalent of iron.

In the paper under notice it is asked whether the term, per-sesquichloride of iron, is correct for Fe_2Cl_3 . It certainly is not; for the prefix, per, is redundant. A chemist may say with propriety that the higher chloride of iron was formerly called perchloride of iron; but that at present it is more precisely called, in view of its admitted composition, sesquichloride of iron.

Philadelphia, March 29th, 1855.

CONCENTRATED WINE OF ASSAFETIDA.

By HENRY N. RITTENHOUSE.

Every pharmacist must have experienced the inconvenience and delay of preparing the assafetida mixture (or milk of assafetida as it is commonly called) of the U. S. Pharmacopœia, when it is suddenly called for in small quantities, and as it is the best of all the preparations of this drug, especially for infantile cases, it should be carefully made, and not as is often the case, (with those whose object is to save time and avoid a little trouble,

without any thought as to the consequences,) prepared by adding tincture to the required quantity of water until it has acquired the proper degree of milkiness to resemble the officinal mixture, a practice which cannot be too highly censured, as it contains a great deal of alcohol, and is of unknown strength. I have made a preparation bearing the name at the head of this article, which I think will remove some of the objections to this officinal, as it is in a concentrated form, easily prepared, containing but little alcohol, is of known strength, and can always be kept on hand.

Take of Assafetida 3ss. troy

White wine f. 3x.

Rub the assafetida in a mortar to a coarse powder, then add the wine gradually, triturating until all the assafetida is suspended. Wine of assafetida as thus prepared is white, of the consistence of syrup, and has the odor of the drug fully developed. This quantity yields two troy ounces of wine, and as each troy drachm contains fifteen grains of assafetida, the mixture or common milk of assafetida is easily prepared by weighing the required quantity into a bottle, adding the water, and shaking them well together. For instance, in making one fluid ounce of mixture of assafetida, all that is necessary is to weigh out one drachm of the wine and add seven drams of water, and shake them together; this forms a perfectly even mixture without any of the usual inconveniences. The quantity of alcohol in a fluid ounce of this mixture is so small as not to be objectionable, and in the wine it is an advantage, as it tends to preserve it. I have kept it in ordinary corked vials three months, partly during summer, without the least perceptible change.

The assafetida used should be free from all impurities, and the wine thoroughly shaken up before using, as it is impossible to suspend perfectly for an indefinite period so large a quantity of the gum resin in so small a quantity of the menstruum. The object of making it so concentrated was that the alcohol of the wine might not be present in any considerable amount. The unpleasant odor of assafetida can be somewhat disguised by making the mixture with peppermint or spearmint waters where they would not be objectionable. I have tried the same experiments with ammoniac, and with similar results.

Philadelphia, March 4, 1855.

ON THE EFFECTS OF THE SUN-LIGHT ON SYRUPUS FERRI IODIDI.

By JOHN M. MAISCHE.

Several months since, I published in this journal the results of a series of experiments on the changes of syrup of iodide of iron, and the effect of light on it. Since then I have made another number of experiments with a view to find an easy way of preserving the iodide of iron in a watery solution, and also to ascertain the manner in which sugar acts on this iodide after its change by the oxygen of the atmospheric air.

A fresh prepared aqueous solution, kept in a filled and well-corked vessel, rapidly undergoes a change, no matter whether it had been kept in the dark or was exposed to the direct rays of the sun. The oxygen of the air which has been absorbed during filtration, separates the iron from iodine in the well known way, by forming under the aid of a corresponding quantity of water, sesquioxide of iron and hydriodic acid, which again decomposes, setting some iodine free. An exposure of this decomposed solution to the sun is of no avail; but after sugar has been dissolved in it, and this saccharated solution is put in the sun-light, it at first becomes colorless and afterwards dissolves the oxide of iron. Repeated experiments with the same results always showed the presence of free iodine before the addition of sugar, as I found it likewise in the syrup which had undergone this change. But after the aqueous solution had been kept (in a closely stoppered vial) for several months, sugar and sunlight did not produce the expected effect of bleaching and dissolving the separated oxide of iron. The reason of this is doubtless to be looked for in the state of the oxide, which, recently precipitated, is a hydrate easily soluble in acids, but changes to a crystalline state, when it dissolves with difficulty even in the stronger acids. The more completely, therefore, the oxide of iron has become crystalline, the less visible will be the influence of sugar and sunlight. A syrup which has stood decomposed with its precipitated oxide of iron for several months, may become lighter, but not colorless, still containing free iodine in solution and oxide of iron as a precipitate.

As it was interesting to know in what chemical way the sun-

light acted on the syrup in causing it to dissolve the oxide of iron, I subjected several specimens to analysis. After an addition of a little sulphuric acid, *iodine* was set free, recognised by starch. This was more evident after precipitating the iron by carbonate of potassa, filtering and adding the acid to the filtrate. This test proves the presence of *iodic acid*, which is separated by sulphuric acid in connection with *hydriodic acid*, the latter deoxidizing the former, forming water and liberating iodine.

The syrups also contained *sesquioxide of iron* in solution, which was found by adding to the diluted syrup a solution of ferrocyanuret of potassium.

Therefore the syrup after the precipitated oxide of iron has been taken up again by the influence of the sun, contains besides *iodide of iron* probably also an *iodate of the sesquioxide of iron*.

The same was found in specimens, which, although several weeks old, had never separated any oxide of iron, and I think is likely to be found even in a carefully prepared syrup after keeping it for some time in closely corked bottles. It seems to me now as if the action of the atmosphere on the syrup depends not only on the oxidation of the iron, but also partly of the iodine, whilst another part of iodine separates as hydriodic acid. I have come to this conclusion from the fact that the syrup is colored and reacts on iodine before the separation of oxide of iron takes place, which is kept in solution by iodic acid. Other experiments, however, which I have commenced, may throw some light on this supposition, and in due time the results will be published.

Philadelphia, March, 1855.

ON COMPOUND SYRUP OF SQUILL.—(HIVE SYRUP).

By A. P. SHARP, OF BALTIMORE.

Hive Syrup being one of the most common and important syrups kept by the pharmacist, it is all important that it should be properly prepared and not likely to ferment. In order to avoid the latter difficulty (which is the common complaint among druggists and pharmacutists,) I have tried several processes, intended

at the same time, to get possession of all the active principles of the root. The following method has proved the most effectual in overcoming the difficulty spoken of, and at the same time yields a beautiful, active and certain preparation.

As soon as one lot is prepared I immediately put another one under way, as follows :

The seneka and squills, (of each 8 oz.,) are bruised to a coarse powder, and macerated with one gallon of diluted alcohol (alcohol 1 part, water 2), until my stock of syrup is nearly out, (sometimes standing two or three months,) and then pressed or transferred to a percolator and displaced. The tincture is then evaporated until I am satisfied there is no more spirit left. I then filter, when cold, to get rid of the albumen and resinous matter, and then add the sugar (7 lbs. troy) and evaporate (without boiling) to the proper quantity, (6 pints), strain if necessary, and add the tartar emetic (96 grs.). Any one pursuing this plan I think will obtain a syrup that will prove satisfactory to himself as well as to his customers.

Although speaking of hive syrup, the reader will excuse me if I take the occasion to hint at a few things which may be of some use to a few, simple and common as they may be to many. In the first place I would suggest as important, to facilitate the operation of filtering the above tincture, as well as many other things in our line, that every pharmacist should have two or three filters of felt, prepared expressly for filtering. Those I have are French, but I presume they can be prepared in any of the cities. No one can appreciate the advantage of them without trial. My smallest size will filter three gallons of laudanum in less than an hour. Percolators are another important article of furniture to a pharmacist, and as they are not easily obtained by persons at a distance from the cities, I will suggest a form (and which any one can obtain without trouble) that I use, and am well satisfied with. From a lot of pint, quart, or any other size packing bottles, I select the thickest one among them, and fill it with cold water nearly to the point where I wish it broken, and then holding it in a bucket to prevent the acid from flying, pour in sufficient strong oil of vitriol, (about an equal measure,) observing to hold the bottle vertical, when the bottom immediately falls, generally presenting a smooth fracture on a line with the surface of the inner liquid. Then with a common file smooth off all the sharp edges. I find

tow is much better than cotton to place in the bottom of the percolator. As a general rule, in displacement, the ingredients should be thoroughly saturated with the fluid before putting them in the percolator, otherwise they will swell up and press so tight as to prevent the proper percolation. Every pharmacist should have a Beaumé's hydrometer for preparing syrups, testing acids, &c. ; also Gay Lussac's or Richter's alcohometer for showing the strength of his alcohol, which should be at least 85 per cent.

In regard to the fermenting quality of sugar, I have found that if a syrup is boiled long it has a greater tendency to ferment from some change taking place in the sugar. For this reason it is well to avoid excessive boiling in syrup making.

Baltimore, March, 1855.

ON AMERICAN OIL OF PEPPERMINT.

BY THE EDITOR.

Perhaps there is no volatile oil, the produce of the United States, that is more liable to be found adulterated, or impure from careless preparation, than that of the *Menthæ piperita*. Afforded in but small proportion, the plant itself requiring careful culture, both as regards the adaptation of soil and frequent attention, and the yield of oil greatly influenced by the season, its price must necessarily be high to remunerate the manufacturer ; yet the consumption of the oil is so extensive by the confectioner and druggist, and so much competition in price has arisen among those who trade in it, that a large proportion of what is found in the market is devoid, in great measure, of the agreeable and refreshing aroma belonging to the pure oil, and much of it has a terebinthinate odor and taste, due to oil of turpentine fraudulently admixed.

Some years ago the best oil of peppermint found in the Philadelphia market was prepared in New Jersey, and known as "Borton's Oil of Peppermint." Subsequently Mr. Borton removed to Ohio, and to this day the best oil from that State goes by his name. Of later years, Western New York has produced large quantities of peppermint oil, and the reputation of the Messrs. Hotchkiss, who grow and distil large quantities of the plant, induced us to address them a few queries, which elicited the following letter, viz :

Lyons, March 15, 1855.

WM. PROCTER, JR., Esq.

Dear Sir.—We acknowledge with pleasure the receipt of your favor of the 23d ultimo, the contents of which have our best attention. Absence from home has prevented an earlier reply. We are extensively engaged in the culture of the peppermint plant and the production of the pure oil therefrom, and for a botanical description of the plant from which our oil is manufactured, its history and uses, &c., we would beg to refer you to "Vol. 3, Class iv., No. 156, pp. 1446, 1447, of the Official, Descriptive, and Illustrated Catalogue of the Great Exhibition," held in London in 1851, and where we had the honor to receive a prize medal for our manufacture of oil of peppermint.

We believe you will "there" find answers to nearly all your enquiries, respecting the article, except the following, viz: "The amount of land under peppermint culture."—"The average yield season with season."—"The amount of care extended to free the mint plants from weeds before distillation;" and which we beg to answer as follows, viz:

In our opinion there is about 2000 acres of land devoted to the peppermint culture in the United States, a great deal of which is under very careless cultivation, and weeds which produce an essential oil allowed to grow amongst it, the most common of which is by some called broom weed, by others mare's tail [*Hippuris vulgaris*]. These weeds produce oils quite as abundantly as the peppermint, but of course they spoil the flavor of the peppermint oil.

2d. The average yield, season with season, is not far from 20 lbs. per acre of pure peppermint oil.

3d. In one field last year of 20 acres, which we devoted to peppermint culture, we kept an account of the labor of planting the roots, preparing the ground, weeding and mowing the plant, and it reached a trifle over eight hundred days work for a laboring man, worth one dollar per day.

* * * * *

With sentiments of great respect,

Yours truly,

H. G. & L. B. HOTCHKISS.

The average yield obtained by the Messrs. Hotchkiss is nearly similar to that obtained at Mitcham, near London, (see vol. xxiii. page 289 of this Journal,) where an acre yields from 17½ to 20 lbs. of oil. We made application to parties in New York to get some idea of the amount of this oil exported to Europe, but our enquiries have not, as yet, been responded to.

The subject of the preparation and trade in volatile oils in the United States is very interesting, and is much obscured for want of information in reference to the different customs followed by the manufacturers, and in regard to the adulterations resorted to

by wholesale dealers to increase their profits, or to enable them to undersell their neighbors. It is a well ascertained fact that, in New England, distillers of oil of tansy have been in the habit of introducing a large quantity of hemlock twigs and leaves (*Abies canadensis*) into the still before putting in the tansy and water, and thus produce an oil in which the common oil of hemlock forms the larger proportion. The great difference of various samples of oils, apparently from first hands, leads to the belief that this species of rascality is not confined to the oil named. As the *dispensing* pharmacutists throughout the United States are deeply interested in this subject, they will greatly oblige us by sending us information bearing on the production or trade in volatile oils, whether relating to a single oil or to several, and in regard to the processes or habits of manufacturers, or the adulterations of dealers, for all which due credit will be given to the writers.

REMARKS ON GUM MESQUITE.

By THE EDITOR.

In our number for January, we published an article on gum mesquite as brought into notice by Dr. G. G. Shumard, in which an account of its chemical characteristics are given. In Silliman's Journal for March Dr. Campbell Morfit, of Baltimore, has published a notice of the same substance from which we extract the following :

"The specific gravity of the gum was 1.5; but this determination may possibly admit of correction upon purer samples than were disposable for the experiment.

Its proximate composition was found to be,—

Water	.	.	.	.	11.640
Foreign matters	.	.	.	.	0.236
Bassorin	.	.	.	.	0.206
Arabin	.	.	.	.	84.967
Ash	.	.	.	.	8.000

100.049

Cerasin was also sought, but not found. The ash was estimated by burning a given quantity in an atmosphere of oxygen, and weighing the residue.

The ultimate analysis, made also by effecting combustion of the carefully dried gum in oxygen gas, yielded, in two separate experiments, the following numbers :—

	I.	II.
Carbon. . .	48.68	48.10
Hydrogen . .	6.11	6.50
Oxygen . . .	47.26	47.40
Ash	3.00	3.00
	<hr/> 100.00	<hr/> 100.00

These proportions approximate very closely to those obtained from gum Senegal and Arabic, by Guerin and Mulder. The general appearance too of the gum is similar to that of gum Senegal and the dark inferior qualities of gum Arabic. In chemical properties also it is allied to them, being insoluble in absolute alcohol, partially soluble in common alcohol, and readily forming with hot or cold water a very adhesive mucilage. It is, in fine, a true gum, and promises, in its physical and chemical behaviour, much of the advantage expected by its discoverer as an economical substitute for gum Arabic or Senegal.

University of Maryland, Baltimore, January 10, 1855."

By a comparison of some of these statements with those published by us as above, it will be seen that several discrepancies exist. Dr. Morfit gives the specific gravity at 1.5, whilst that obtained by us of a solid lump (by carefully weighing in oil of turpentine of ascertained density, and reducing the numbers by calculation,) was 1.811, very nearly that of gum Arabic. In every instance, and we examined several of the pieces, we found them entirely soluble, except extraneous matter, (bark and other impurities) and saw no evidence of bassorin, (yet as this principle may be considered as matter in transition between lignin and arabin it may easily exist in some specimens and not in others, as is the case with the acacia gums.) The amount of ash obtained by incineration in a platina crucible was but 2.1 per cent., whilst in the above analysis it was 3 per cent. Dr. Morfit's conclusion that gum mesquite is composed chiefly of arabin, is the chief point in his paper to which we take exception, as the opinion does not appear to be founded on any direct test, except insolubility in alcohol and capability of yielding a mucilaginous solution, as the ultimate analysis of the whole gum will hardly be brought as positive evidence of the identity of the soluble matter of gum mesquite and gum arabic. The most striking points of difference in their reactions are—that a solution of gum mesquite is not precipitated by subacetate of lead, nor a dense solution coagulated by borax, and on these grounds the chemical identity of the soluble matter of gum mesquite and the arabin of gum arabic may well be doubted.

Before concluding these remarks, it may be well to suggest that advantage may be taken of the compatibility of gum mezquite and subacetate of lead to use the mucilage of that gum as a vehicle for Goulard's Extract, in those cases where it is desirable to have the emollient and protective influence of mucilage, with the astringent and sedative action of the lead salt. The association of mezquite mucilage and subacetate of lead, with sufficient glycerin to keep it from drying too rapidly, would be a good substitute for many of the less elegant and efficient dressings:—of course the proportion of subacetate should be regulated by the physician in applications to excoriated surfaces.

ON CAFFEIN.

By H. LEUCHSENRIING.

Caffein possessing decided physiological and therapeutic properties, I submit to the notice of our profession a simple and easy process for obtaining it.

A concentrated decoction of coffee or tea,* (cocoa or guarana) is precipitated by a weak solution of acetate of lead; the liquor is filtered and evaporated to dryness; the residue is mixed with fine sand and allowed to sublime by the process of sublimation of Dr. Mohr for benzoic acid.

Caffein thus obtained is in prisms, white, opaque, silky and compact, of a bitter taste, soluble in 98 parts of water—97 of alcohol and in 194 of ether—fuses at 170° Cartier—volatilises at 185°. Its solution in hydrochloric acid is precipitated white, and in chloride of platinum yellow, by tannic acid.†

* *Theobroma cacao* or *Paullinia sorbilis*.

†[NOTE BY THE EDITOR.—This process is the same as that of the Hanoverian Pharmacopœia, a notice of which was published at page 472, vol. xxv. of this Journal. H. J. Versmann (Archiv. der Pharm. lxxviii. p. 148) gives a process in which 5 parts of raw coffee in powder mixed with one part of dry hydrate of lime is treated in a displacer with alcohol (sp. gr. .863) until exhausted. The alcoholic liquids are distilled to regain the alcohol—the fixed oil which floats on the aqueous residue separated, and the residue evaporated, till on cooling it solidifies by crystallization. After standing a while the mother liquid is drained off—the crystals passed between paper to remove the fixed oil, and after solution in boiling water and treatment with

ON THE PREPARATION OF AMYGDALIN FROM PEACH KERNELS.

By SAMUEL S. GARRIGUES.

Procter (Amer. Jour. Pharm. x. 195) and Wicke in (Annal. d. Chem. und Pharm. 1858) have shown, that amygdalin is more generally diffused through the pomaceæ and amygdalaceæ than had formerly been supposed; and they found it more particularly generated in the kernels of the fruits of these species. This suggested the idea, whether the kernels of the common peach would not be a cheaper, and a good substitute, for bitter almonds in the preparation of amygdalin. The process recommended by Wittstein, was followed in making my investigations. Thirteen pounds of the dried kernels were finely bruised, slightly warmed, and then subjected to a strong pressure so as to separate as much as possible the oil, which would interfere with the crystallization of the amygdalin. The cake was then removed from the press, and rebruised as finely as possible, and treated with three times its weight of alcohol of 80 per cent, for six hours, at nearly a boiling temperature. It was then strained, whilst warm, through a linen bag, the remainder being again treated with the same quantity of alcohol. The filtrates were then mixed and allowed to stand for a short time, so as to admit of the separation of the oil which subsides at the bottom of the vessel. A portion of amygdalin which also crystallizes out of the solution, is separated from the oil by filtration and pressing between filtering paper. The alcoholic solution was now distilled by a slow fire to $\frac{1}{3}$ of its original quantity, and then filtered warm through paper previously wet; the filtrate was then evaporated by a moderate heat to the consistence of thin syrup, and allowed to stand in a cool place for several days. After the syrup had hardened to a crystalline mass, it was mixed with one half its volume of cold alcohol, thrown on a filter and well washed with the same liquid. The crystals were then dissolved in double their volume of hot alcohol, filtered whilst hot, and then allowed to crystallize. The mother liquid also produced

animal charcoal are re-deposited in dazzling white satiny crystals. 100 lbs. of coffee yielded M. Versmann 6 oz. 4 scruples of caffein, or 0.57 per cent. He also obtained 10 per cent of green fixed oil, and 2 per cent of yellow solid fat.]

crystals on further evaporation. After being dried between bibulous paper it was pure enough for medicinal purposes, though by treating it with ether, the fatty oil which adheres to it can be entirely removed.

By this process I obtained about 80 grains of amygdalin to to the pound, somewhat less than the yield from bitter almonds; but when we take into consideration the reasonable price at which the peach kernels can be obtained, I think they will form an advantageous substitute.

The peach kernels yield about one fourth of their weight of fixed oil, which when not too much heated in the process of pressure, will be found to answer most of the purposes of oil of sweet almonds.

Philadelphia, April, 1855.

EXTRACTUM IGNATIÆ AMARÆ ALCOHOLICUM.

By THE EDITOR.

For several months past some of the pharmacutists of Philadelphia have been called on for an alcoholic extract of the bean of St. Ignatius, required in the form of pills, each containing three quarters of a grain, the pills being intended as a "remedy" for dyspepsia, attended with nervous depression. The formula for the pills, it appears, is furnished by a clergyman of Brooklyn, to all who may apply, he having been cured by it. That so potent a medicine should be prescribed in this loose way, the patient being, in fact, the prescriber, inasmuch as he decides that it is indicated in his case, is a little extraordinary, and may yet lead to mischief. As, however, several physicians are trying its merits, it will soon be ascertained whether these seeds possess any peculiar or specific power, not found in their congener, *nux vomica*, or whether any advantage their extract may possess, is due solely to the larger proportion of *strychnia* which they are known to contain.

The beans of St. Ignatius, like *nux vomica*, have a very horny and tough kernel, (due to *bassorin* and fixed oil,) which renders it difficult to powder them so as to extract their soluble matter. We have tried several plans, but prefer the following for their extraction. The beans are bruised in an iron or brass mortar

until reduced to small fragments or very coarse powder; they are then moistened with water in a covered vessel, and heated until the tissue of the pieces has become soft and can be bruised into a pulpy mass. This is then mixed with twice its bulk of alcohol, .835, and allowed to macerate in a close vessel in a warm place for 24 hours, and then treated by displacement until 8 or 10 times the weight of the drug is obtained. The alcohol is then distilled off, and the residue heated in a water bath until reduced to the consistence of a soft extract.

Treated in this way, the beans of *St. Ignatius* yield about ten per cent of extract, having a brown color, peculiar heavy odor, and an intensely bitter taste. The proportion of extract obtained is smaller, (and is contaminated with fixed oil, like the official extract of *nux vomica*), if the seeds in powder are treated directly with alcohol, and thus made it is probably more active; yet, as these beans contain 1.3 per cent. of strychnia, and *nux vomica* but .8 to .4 per cent., this extract must be considerably more active than the official extract of *nux vomica*. The pills are directed to be made by incorporating 30 grains of the extract, with ten grains of gum arabic in powder, and dividing the mass into forty pills; one of which is to be taken three times a day. We are informed that some apothecaries substitute extract of *nux vomica* when called upon for that of *Ignatia amara*—a practice not to be justified, however analogous the preparations may be.

FLUID EXTRACT OF HYDRANGÆA.

By EDWARD PARRISH.

The root of *Hydrangæa arborescens*, an indigenous plant found in many parts of the United States, was introduced to the notice of the medical profession by Dr. T. W. Butler, of Burlington, N. J., through the *New Jersey Medical Reporter*.

Dr. Butler states that his father, who is connected with the mission to the Cherokees, learned of them the merits of this plant in the treatment of gravel and stone, and has himself employed it, in the course of an extensive practice, among a people peculiarly subject to these complaints, for many years. He considers it as a most valuable medicine, and possessed, perhaps, of

specific properties, claiming for it a trial at the hands of practitioners. Dr. Butler's recipe is as follows:—

Take of Root of Hydrangea	lb. ii.
Water	Oxii.

Boil to four pints, strain, and add

Honey	Oii.
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Boil further to two pints. The dose is a teaspoonful twice or three times a day. I have prepared the fluid extract of latter time by the following modified recipe, which is quite satisfactory:—

Take of Hydrangea	lb. j.
Water	6 pints, or sufficient.

Boil the root in successive portions of water, for a long time, mix this with honey Oij., and further evaporate to Oii. The dose of this is the same as the foregoing, although less concentrated.

The results of its use in irritable conditions of the urethra have proved highly satisfactory, although its value as a specific in lithiasis requires confirmation.

GLEANINGS.—PHARMACEUTICAL AND MEDICAL.

Fluid Extract of Red Bark.—Mr. John Canavan, in the November number of the New York Journal of Pharmacy, [1854,] gives a formula for fluid extract of bark, without, apparently, being aware that two formulæ for similar preparations were published in vol. xxiii, p. 129, of this Journal, and one of them noticed at page 262, U. S. Dispensatory, 10th edition. The preparation made by Mr. Taylor's formula has been extensively used and approved of, and its efficacy is attributable to its being made from calisaya bark, and not containing any sulphuric acid, so that the alkaloids are presented in the same state of combination that occurs naturally, viz: kinates and cinchotannates. Owing to the presence of the latter, Mr. Taylor's fluid extract is always opaque when cold, although transparent when hot. The following is Mr. Canavan's formula:—

Take of Powdered red bark,	8 ounces (Troy.)
Diluted alcohol,	a sufficient quantity.
Diluted sulphuric acid,	“ “
White sugar,	8 ounces (Troy.)

Digest the bark in four pints of diluted alcohol, for 24 hours ; then filter, and displace the dregs that remain in the filter, with diluted alcohol, acidulated with the diluted acid until the liquid passes nearly tasteless. Then mix the two liquors, evaporate to one pint, and filter ; to this add the sugar and dissolve without heat. The whole measures about twenty fluid ounces, and a teaspoonful (one drachm) represents about twenty-five grains of the bark. During the evaporation, the coloring matter of the cinchona is nearly all precipitated along with the resin, which retains a small portion of the alkaloids."

The proportion of sulphuric acid is not mentioned, which is an imperfection, as, not being volatilized in the concentration of the tincture, it is all retained in the fluid extract, if inadvertently used in excess.

Glycerin as an Internal Remedy.—Dr. J. L. Crawcour, of New Orleans, (New Orleans Med. News and Hosp. Gaz.) calls the attention of the medical profession to the "*special action of glycerin on the economy, and the perfect safety with which it can be used as an internal remedy.*" He employs it in all cases where he formerly used cod-liver oil, and with better effect, for it possesses all the remedial virtues of the latter without disordering the digestion. It has been employed in phthisis and scrofulous disease with marked success. In addition to its antistrumous property, Dr. C. finds that it materially aids in the assimilation of the salts of iron, especially the iodide. The dose administered is from one to three drachms, three times daily in an ounce of water ; in from one to two drachms, it, in a short period, relieves the cough, improves the digestive powers, and increases the deposition of fat. The author directs attention to the impurity of much of the commercial glycerin, and the presence of lead in some of it, should be especially looked to when used internally. Dr. Crawcour suggests that hot glycerin will dissolve phosphorus in the ratio of two grains to the fluid ounce, and considers the resulting glycerole of phosphorus as much superior to common phosphoretted oil. From the effect of this solution on himself, he is of the opinion that in this form phosphorus more readily enters the circulation and manifests its peculiar stimulant action. He thinks 10 to 30 minims as sufficient ; as a fluid drachm taken by himself so disturbed the func-

tions of the heart and brain as to make him consider that dose excessive, although representing but a quarter of a grain of phosphorus.

Preserved Meat-Juice.—Prof. R. Christison, of Edinburgh, in an article in the London Monthly Journal, calls attention to the preserved meat-juice of Mr. Gillon as a very useful article. We quote the following from the (Philad.) Medical Examiner's notice of this paper.

"This substance is the pure juice of beef, preserved in the way in which meats and vegetables are now so extensively preserved in the fresh state, for store provisions. The mode of preparation is as follows:—Cylindrical cases of tinned iron are filled each with six pounds and a half of beef: and the lid is soldered on, but with a hole about half an inch in diameter in the middle of it. Two trays of such cases are shoved into iron retorts, analogous in form to retorts for gas-making, but double-cased, so that steam may be introduced into the interstices around. They are thus subjected to a heat of 220° under steam pressure, for about three hours; by which the beef is partially cooked, and, being thus made to contract strongly on itself, squeezes out a portion of its juice, amounting to a few ounces from each tin. The tins are then drawn, the juice is poured out, and the meat, with certain additions, is subjected to the preservative process. The juice, after being cooled, and entirely freed from fat, is put into small four-ounce tin cases. Each of these has a small aperture at each end, which is secured by solder, after the juice is poured in. The tins are then subjected, on trays, to a temperature of 220° in a muriate of lime bath. On being removed, the solderer rapidly touches with his iron the solder on top, which giving way allows steam to rush out forcibly, and carry with it the air in the upper part of the interior. By the time he has thus swiftly passed over sixteen or twenty tins, the first is ready for being re-soldered by a similar dexterous application of his iron, which then in succession as quickly secures the whole open and steaming apertures. The process of heating in the bath, tapping, and resoldering, is then repeated a second time, to make sure of the thorough expulsion of every particle of air. The tins are finally painted, to preserve them against rust.

The process is most perfect. I have repeatedly opened tins eighteen months in my possession, and stated to have been many months in store when I got them, and in every instance the contents had the rich delicate aroma and taste of fresh beef-juice. Sometimes the taste is slightly resinous or soapy, in consequence of a little resin having obtained admission in the operation of soldering. But as this does not occur often, the impurity may be avoided with due care. The juice may be taken with relish in small quantity, either cold or warm, in its concentrated shape; but it is rather strong to be used without dilution. When diluted with three times its volume

of boiling water, and duly seasoned with salt and pepper, it makes a more palatable beef-tea than any which can be made in the usual way. Sometimes, indeed, a patient will be found to prefer the ordinary sort, either because the preserved juice has unluckily been resinous, or on the same principle that leads some people from the plains of England to prefer hard water to the pure mountain springs of the primitive districts of Scotland, viz: because they are not accustomed to the finer sort. But this is not the general fact; and there can be no doubt that the preserved meat juice makes a most palatable beef tea, and an equally eligible basis for many soups."

Attention has lately been recalled to the value of the matters soluble in water to be extracted from flesh—ozmazome and saline matters—as a nutriment for invalids, when ordinary food disgusts, or will not be borne. In many of these cases, beef-tea, properly prepared, stimulates the appetite, and greatly helps the physician in the difficulties often met with in the dietetical treatment of patients. Liebig also has published a recipe for meat broth. In relation to its *modus operandi* Dr. Christison remarks:—

"What is its mode of action? Not simply nutrient. A quarter of an ounce of the most nutritive material cannot nearly replace the daily wear and tear of the tissues in any circumstances. Possibly it belongs to a new denomination of remedies, whose action never was even suspected to exist until recently—those which, by some peculiar influence, diminish the waste of the tissues under the exercise of their functions. Professor Lehmann has proved (*Annalen der Chemie*, 1853) that coffee possesses this singular property in so remarkable a degree, that, in persons following an active occupation, an infusion of an ounce of roasted coffee daily will reduce the daily waste by a fourth part; and the same property seems likewise to belong to tea, and other restorative beverages. It is not improbable that the sapid and saline principles of meat, united to what is called ozmazome, and constituting the ingredients of beef-tea and meat-juice, possess some such property. It is difficult otherwise to account for the interesting results obtained by the late Dr. Edwards, in 1833, who, in his researches on nutrition,—strangely overlooked by the celebrated Gelatin Commission of the French Institute, in their condemnatory report on gelatin in 1841,—found that dogs die slowly if fed on bread and gelatin alone, but, when thus greatly reduced, quickly regain flesh and strength by the addition of two ounces of meat-tea, which cannot appreciably increase their texture by its own insignificant amount of solids. Either it acts as a digestive ferment, so to speak,—promoting the assimilation of other nutriment—or, like coffee, it must lessen the waste of the tissues in the exercise of their functions.

Mr. Gillon's meat-juice contains only $6\frac{1}{2}$ per cent. of solids. As a mere

nutrient, therefore, it is much in the same category with beef-tea. Sixteen ounces of beef-tea, made with the contents of one tin, yield only 114 grains of solid extract. It contains no fibrin, no albumen, no gelatin. It does not even gelatinize on exposure to the air for days; it is ozmazome, with the salts and sapid and odorous principles of meat, and is materially different from all boiled extracts."

EXTRACTUM SUMBUL FLUIDUM.

BY WILLIAM PROCTER, JR.

Sumbul, or *musk root*, was introduced into German Pharmacy about the year 1840, and from thence has gradually made its way into France, England and the United States; first as a curiosity of the *Materia Medica*, and afterwards as the basis of several pharmaceutical preparations. Musk root enters Russian commerce through Kiakta, from Central Asia, where it has long been in use as a medicine, and through Russia other countries are supplied. Notices of this root have already been published in this Journal (vol. xvi. 119, and vol. xxiii. 223) and the last editions of the U. S. Dispensatory and Pereira's *Materia Medica* describe it. Reinsch has examined the root and found an essential oil, (not the source of its musk odor,) a nearly colorless copaiba-like oleo-resin, a waxy substance, a bitter substance, coloring matter, starch and gum. He also found that the oleo-resin, by treatment with potash and water, yielded a crystallizable substance having a powerful musk odor. As the substance giving musk odor to this root does not distil over with water, and is communicated to water in the decoction, it is probably constituted, in some respects, like that of vanilla. The oleo-resin is chemically the most interesting ingredient, and is best extracted by ether and alcohol. The chemistry of musk root deserves more attention than it has yet received.

Within a few months past several physicians of Philadelphia have prescribed a fluid extract of sumbul, which is stated by Mr. Simes to be of the strength of a grain to the minim. As musk root is analogous in its therapeutic properties to valerian, the following recipe has been made to correspond in strength with the official fluid extract of valerian for this reason, as well as because its peculiar constitution seems to require more menstruum than the proportion stated by Mr. Simes.

Take of Musk root,	four ounces (troy)
Ether,	four fluid ounces.
Alcohol and water,	of each, q. s.

Bruise the musk root, moistened with a little alcohol, until reduced to a coarse powder; mix the ether with twice its volume of alcohol, pour it on the musk root, macerate in a covered vessel, for 24 hours, and introduce the mixture into a suitable percolator. The absorbed tincture (which has a light brown color) is displaced slowly by alcohol (sp. gr. .835) until twelve fluid ounces are obtained, when the process is continued with a mixture of alcohol and water (equal parts) until a pint has passed. Water is then poured on the residue until a pint of liquid has filtered. The ethereo-alcoholic tincture is suffered to evaporate in a warm place until reduced to two fluid ounces; the hydro-alcoholic tincture is concentrated on a water bath to the same bulk; and the watery infusion evaporated to one fluid ounce. The two last liquids are now mixed, three fluid ounces of pure alcohol added to the first (ethereal) liquid to dissolve the oleo-resin, and the other mixture added gradually with agitation, so that the whole shall measure eight fluid ounces, the mixture being afterwards shaken occasionally for 24 hours. A portion of oleo-resin and some gummy extractive remain undissolved, and must either be removed by filtration or left as a sediment.

When the ethereo-alcoholic tincture is evaporated to one-sixth, nearly all the oleo-resin separates, and hence the necessity of redissolving this by alcohol before adding the other liquids.

The dose of this fluid extract is from 15 minims to a fluid drachm. The properties of the preparation are analogous to those of valerian, and are used in hysteria, dysmenorrhœa, and other nervous disorders, and Dr. Wood informs us that it is highly valued in Moscow as a remedy in delirium tremens.

ON THE MATERIA MEDICA OF THE SANDWICH ISLANDS.

By LUTHER H. GULICK, M. D., of Ascension Island.

[The following notices taken from a paper on the "Climates, Diseases and Materia Medica of the Sandwich (Hawaiian) Islands," by Dr. Gulick, published in the New York Journal of Medicine and Collateral Sciences for March. It is, in reality, a matter of secondary moment, whether these Islands belong to the United States or not, but it is of great importance

that their tropical productions should be increased and encouraged, so as to become to the Pacific States what Cuba and the Bahamas at present are to the Atlantic region—a perennial fruit garden and salubrious resort for the invalid.—EDITOR AMERICAN JOURNAL OF PHARMACY.]

The *Arum esculentum* is a plant very nearly allied to the *arum maculatum* and *arum triphyllum* in all its external habits and properties, and probably, like them, possesses a “property of stimulating the secretions, particularly those of the skin and lungs.” (U. S. Dispensatory.) It is the principal article of diet among the Hawaiians. The heat of the oven dispels its peculiar acrid principle and renders it a very nutritious and valuable article of diet, had in great esteem by foreigners, but especially by the natives. The acidity is probably reduced by cultivation, but a very considerable portion of it is still retained. Says Dr. Chapin:—“It is, when raw, very styptic and acrid, and the skin of the root is used by the natives in the cure of dysenteries and intestinal hemorrhages.”

The *Cucurbita lagenaria*, or gourd, is used as a purgative. It is, in its medical properties, allied to several of the cucurbitacæ, particularly to the *cucumis colocynthis*. “The pulp of the root is used,” says Dr. Chapin, “and in large doses it is terribly drastic. The inordinate doses given by the natives sometimes produce dysentery, rapidly fatal.” Dr. Judd relates the case of a woman purged to death with this article by a native physician, for an imagined disease. “About four feet of the green running vine of the bitter calabash, or gourd, thirty-two feet of the hollow stems which support the leaves, and about one ounce of the dry pulp, next the shell, of the dried gourd, were pounded together on a board and the juice mixed with about three pints of water.” “It is used by them successfully in dropsies. I once knew a native, with abdominal dropsy, cured by one of his own physicians with this article, after he had been treated unsuccessfully by foreign skill.” (Dr. Chapin.)

A variety of *Ipomea* is mentioned by Dr. Chapin. “The roots are used by the natives as an emetico-cathartic. I tried it somewhat, and found it had efficacy; but the doses requisite were so large and the trouble of preparing it such, I abandoned it.” I am utterly unable to give the specific title. It is questionable whether its medical powers have been fully ascertained.

The *Aleurites triloba*, or candle-nut, is one of the articles of

the Hawaiian Dispensary. "The kernels of these are stuck, one over another, like beads, upon a fibre of cocoa-nut leaf, a foot long, and, containing a considerable proportion of inflammable oil, they give sufficient light for ordinary purposes, the flame communicating downward till the last piece is consumed. Sometimes five or six such strings, two yards in length, are wrapped in a leaf of banana, and carried before the king, as flambeaux, when he travels by night." (Tyerman and Bennet's Journal.) Dr. Chapin remarks:—"I know it to be used as a cathartic, but never experimented with it myself." An oil extracted from this nut forms an article of export for painting—may it not have available medicinal properties?

The *Piper methysticum*, called "*ava*" by the Hawaiians, is one of the most important of their indigenous Materia Medica. From it they prepared a narcotic drink, esteemed throughout Polynesia. The bark of its stem is possessed of the peculiar properties of the plant, but it is the root which was principally used by them. "They prepared it for use by mastication. A person chews it thoroughly, and ejects it with the accumulated saliva into a dish, in which state it is drunk by the patient. Most of their medicines they prepare in the same manner." In continuation, Dr. Chapin says to the author:—"I supposed it might be serviceable as an anodyne: I gave it repeatedly in powder. It did not seem to possess narcotic properties, and after a number of trials with it I gave it up. The natives, as they said, used it to cure cutaneous diseases, by producing desquamation of the cuticle. They give it daily in such quantities as at length to accomplish the object. I think the article deserves further trial." Mr. Bingham informs me that "the juice is highly valued, and was much used both as a luxury and as a medicine, as alcohol still is in wiser countries. A singular effect of taking a course of *ava* was the cracking and coming off of the cuticle over the whole body of the patient, with which, it is maintained, the system parted with maladies." Mr. Jarvis says:—"Its effects were very pernicious, covering the body with a white scurf, * * * inflaming the eyes and causing premature decrepitude. It was also taken as a medicine, and was supposed to be an effectual remedy for corpulence." 'Mr. Ellis speaks of the "burning effect and unpleasant taste of the *ava*." A few years since, a gentleman, long a resident of the Islands,

proposed exporting it to the United States, and there manufacturing of it some nostrum—which might, no doubt, have become as popular as Townsend's Sarsaparilla! Its medicinal properties are, perhaps, allied to those of the *Piper angustifolium*, or Matico, of which the U. S. Dispensatory says:—"Its most useful internal application is, probably, as an alterative stimulant to the diseased mucous membranes." The Dispensatory refers to an article by Mr. Morson, on the *Ava*, in *The Pharm. Journal and Transactions*, Vol. 3, p. 472, which I have not been able to obtain.

Lime (calx) is readily prepared by the calcination of coral.

Nitre (potassæ nitras,) of which J. G. Sawkins remarks, it "is not found pure, so far as I can learn, on this group." (*Agricultural Report*, Vol. 1, No. 2.)

Sulphur, from about the crater of Kilanea.

Common Salt (sodii chloridum) is manufactured in considerable quantities from the ocean, and is also collected from the salt lake of *Alia-packai*. During the year ending June 30th, 1851, 5,332½ barrels of salt were exported. Mr. Sawkins remarks of the Island salt, that it is "rarely pure, on account of the sulphurous gases of the neighboring active volcanoes."

Glauber's Salt (sodæ sulphat.) is found at Kilanea, and has been occasionally used.

Sponges (spongia officinalis.) They are, however, a very coarse, inferior article.

The Sorrel (rumex acetosa.)

Arrow-root (tacca oceanica.) From July 1st, 1850, to June 30th, 1851, inclusive, 16,780 pounds of prepared Arrow-root were exported. I extract the following from The United States Dispensatory:—"A variety of Arrow-root has been imported from the Sandwich Islands. It was supposed to be procured from the root of *Tacca pinnatifida*, which grows abundantly in Tahiti and other islands of the South Pacific; but Mr. Nuttall, during his visit to the Sandwich Islands, found that it was the product of another species of *Tacca*, which he describes under the name of *Tacca oceanica*. (*Am. Journal of Pharmacy*, ix., 305.) It is said that a similar product is obtained from *Tacca pinnatifida*, growing in the East India province of Arracan."

The Sugar Cane (saccharum) is by far the most important of the indigenous Materia Medica, in a commercial aspect. The

manufactured *Sugar* which was exported, amounted in 1849 to 653,820 pounds, and in 1850 to 750,238 pounds. The exported *Molasses* (sacchari fæx) amounted in 1849 to 41,235 gallons, and in 1850 to 53,855 gallons.

A large number of the "Flora Medica" have been introduced since the discovery of the group. Quite a number of them are thoroughly naturalized; and some are already of great importance among the exports, though in every such instance the article is not only a medicine, but also a food. Without question, the Sandwich Islands will yet produce for export many of the *Materia Medica* proper. From the paucity of my facts, I can do little more than give a mere list of these introductions, and even this will be defective.

I will not mention the *unofficinal* articles.

Coffee (cofea arabica.) This was first permanently introduced by Lord Byron in 1828. In 1849, 28,231 pounds of coffee were exported, and in 1850, 208,428 pounds. (Cheever's *Sandwich Islands*.) It is of an excellent quality.

Indigo (indigofera.) In many parts of the Islands it now grows wild. From experiments made by the writer many years since, the Sandwich Islands indigo may be pronounced a good variety—probably quite as good, in its medicinal and economical and manufacturing properties, as any in the markets of the world.

The Touch-me-not (impatiens noli-me-tangere) grows luxuriantly.

Onions (capa.) They are greatly relished by the natives as a condiment, and raised by them in considerable quantities. During the year ending June 30, 1851, 3,759 barrels were exported.

The Irish Potato (solanum tuberosum.) Of these there were exported, in 1849, 858 barrels, and in 1850, 51,957 barrels.

Indian Corn or *Maize* (zea mays) grows well; is not extensively raised. During the year ending June 30, 1851, five barrels were exported.

Indian Rubber or *Caoutchouc* (syphonia cahuchu, or *S. elastica*.) A very useful tree, which it is to be hoped will be rapidly multiplied on the Islands.

Rice (oriza sativa.) As yet it is only raised experimentally, but it may become an important production.

The Pumpkin (cucurbita pepo.) *The Muskmelon* (cucumis melo.) *The Cucumber* (cucumis sativus.)

Of *officinal* plants, the following imperfect list will serve our purpose of exhibiting the admirable adaptation of the soil and climate to the production of many choice articles, and of indicating how independent of other countries, as to their *Materia Medica*, these Islands may become.

The Castor Oil (*ricinus communis*.) This may be said to be effectually naturalized. In many places it grows, becoming a perennial. As yet no considerable use is made of it. There may, however, come a time when Castor Oil shall be manufactured there, not only for home consumption, but for export from the Islands—a rival even to “the cold-drawn East India oil.”

Mustard (*sinapis*) grows wild over considerable tracts. I am not aware that it is at all used, even as a condiment, though, no doubt, possessing requisite strength. Mustard is even imported for the tables of foreign residents.

The Pomegranate (*punica granatum*) has been brought to maturity on the Sandwich Islands, and is, no doubt, still cultivated by those of horticultural tastes. The rinds of the fruit (*malecorium*,) and the flowers (*balaustines*,) may yet be valued among the rural inhabitants for their astringent and tonic properties; though, if it be true, as before stated, that verminous affections are rare, the famed properties of the bark of the root may not be called into requisition.

The Stramonium (*datura stramonium*,) introduced many years since, now propagates itself, and was, about Honolulu, the nuisance of my boyish days. This powerful narcotic, so identical in its effects with belladonna, though by no means to be employed as a popular remedy, may yet be made valuable to the Island practitioner.

Several members of the genus *Citrus*—*The Orange* (*c. aurantium*,) *The Citron* (*c. medica*,) *The Lemon* (*c. limonium*,) *The Lime* (*c. acris*)—which are, I believe, all introduced, form an important group. The orange was first planted on the Islands by Capt. Vancouver, 1792. As a fruit, they have already become quite an article of export. In 1849, 10,000 were exported, and in 1850, 139,500. I know not why the Sandwich Islands may not produce the much sought orange flower water (*aurantii floris aqua*,) used both in the toilet chamber and the apothecary's shop; and if the flowers of the Seville or bitter orange (*citrus vulgaris*) be preferable, it can, no doubt, be added to the Island Flora.

The oil, or neroli (*aurantii oleum*) will, no doubt, possess as fine a scent as that of France or Italy. Three hundred and four gallons of lime juice (*limonus' succus*) were exported in the year ending June 30th, 1855.

Cotton (*gossypium*.) This article, so useful in burns, grows well, and is of good quality. It has not become an article of export.

Wheat (*triticum*.)

Oats (*avena sativa*.) These two grains, officinal in the Pharmacopœia, and of such noted importance in other departments of civilized life, are every year becoming more important articles of culture for home consumption.

Coriander (*coriandrum sativum*.) *Fennel* (*foeniculum vulgare*.) *Anise* (*pimpinella anisum*.) *Horseradish* (*cochlearia armoracia*.) *Cayenne Pepper* (*capsicum*.) *Black Pepper* (*piper nigrum*.) *Rhubarb* (*rheum*.) *Lettuce* (*lactuca sativa*.) *Sage* (*salvia*.) *Carrots* (*daucus carota*.) *The Broom* (*cytiscus scoparius*.) *Ginger* (*zingiber*.) *Hops* (*humulus lupulus*.) *Roses* (*rosa gallica*.) *Poppy* (*papaver somniferum*.)

Aloes (*aloe*.) I think I am correct in mentioning this, though as yet it is only cultivated for ornament.

The Tamarind (*tamarindus Indica*) has long been introduced, and is a very valuable tree for the tropic zone.

Tobacco (*nicotiana tabacum*) has been long cultivated on the Islands, and promises to become a very important export.

Figs (*figus carica*) are being more and more cultivated, and may become an important export.

The Grape (*vitis vinifera*) grows well in some localities, and it is now a subject of active discussion and experiment, whether it may not be extensively cultivated. Should the anticipations of some be realized, the Hawaiian Islands are to become as noted for their wines as Portugal or Madeira. Thus, to repeat Edmund Burke's witticism, the Sandwich Islands producers are aspiring to the rights of kings, viz. : to the "*jus de vinum*." While the *Grapes* are cultivated for luxurious contributions to the table, and while the *Raisins* are dried for the home and foreign markets of future days, as medical men, we may "hope against hope," that *Hawaiian Wines*, with all their variety and excellence, shall be manufactured for the *Materia Medica* rather than for the *Materia Alimentaria*.

RESEARCHES ON THE CONSTITUTION OF QUININE.

BY ADOLPHUS STRECKER.

(Translated from the *Annalen d. Chemie und Pharm.*, August, 1854. By J. M. MAISCH.)

The importance of quinine as a remedy, the increasing difficulty of obtaining it in sufficient quantities from the Peruvian barks, and in consequence thereof, the increase of the price of it, which will still rise with the increasing clearing of the cinchona forests; all this has given a new incitation to the hope entertained by scientific men to obtain quinine artificially, the more so as several rewards have been offered for such a discovery. The interesting researches by A. Wurtz and A. W. Hofman, which have made us acquainted with a large number of artificial bases, and which have thrown much light on the constitution of those bases free of oxygen, justify the hope to obtain those alkaloids which contain oxygen, in a similar manner, after their real constitution shall have been ascertained by future researches.

The chemical properties of quinine, notwithstanding its great importance, are still less known than those of other bodies of much less interest. Not even on the per-centric composition, much less on the chemical formula, do the chemists agree. With regard to its constitution there has hardly been dared to venture a supposition.

Before it is possible to "compound" quinine, the per-centage of its elementary constituents, its equivalent and empiric formula, its real components must be investigated and settled, and then these components must either be looked for in other organic products, or else be formed artificially.

The following may be considered as a contribution towards that end:

If the old formula $C_{60} H_{30} N_3 O_6$, found by Pelletier and Dumas, be dropped, there are still three formulæ between which chemists are divided. Liebig expresses the equivalent of quinine by $C_{20} H_{12} NO_2$; Regnault calculated the formula $C_{41} H_{25} N_2 O_4$, which, corrected in accordance with the real equivalent of carbon, is $C_{40} H_{24} N_2 O_4$; Laurent obtained the formula $C_{38} H_{22} N_2 O_4$. The first two are alike in per-centage, and differ only in the equivalent; but the last one differs materially from the former.

Without at first paying any attention to the equivalent of quinine—as Liebig and Regnault agree not only on the (per-centage) composition of it, but also of its salts—the question remains to be solved, whether $C_{38} H_{22} N_2 O_4$ or $C_{40} H_{24} N_2 O_4$ expresses the real composition, and this may be done by experiment, independently of any theory whatever.

Liebig and Regnault, in their analyses by combustion, used oxide of copper, by which, however, the complete combustion of bodies with a large amount of carbon is unreliable; Laurent added oxygen to the same. The analyses of these three chemists, however, agree in the amount of carbon. Some time ago Wertheim published that, according to his analysis, quinine contained 20C (or 40C) and not 19C (or 38C) as Laurent thinks. Wertheim's experiments, however, not having been further promulgated, are therefore useless in coming to a decision.

To obtain pure quinine, I have precipitated sulphate of quinine by ammonia, washed and dried the precipitate, treated it with ether, until most of the quinine was dissolved. The solution was evaporated, the residue again treated with a little ether, this evaporated, the residue dried at first under the air-pump and afterwards at $120^{\circ}C$. ($248^{\circ}F$.) The combustion was carried on with oxide of copper and oxygen, the open extremity of the tube containing metallic copper. The following were the results :

0.2912 grm. gave 0.7905 grm. carbonic acid and 0.1970 water.
 0.2798 grm. " 0.7600 " " 0.1890 "

These results I put alongside with those of Liebig, Regnault and Laurent.

Calculated.				Obtained.			
				Liebig.	Regnault.	Laurent.	Strecker.
C_{38} 73.5	C_{40} 74.1			74.2 73.8	73.5	73.8 73.5	74.0 74.1
H_{22} 7.1	H_{24} 7.4			7.6 —	7.6	7.1 7.1	7.5 7.5
N_2 9.0	N_2 8.6			8.1 —	8.5	— —	— —
O_4 10.4	O_4 9.9			— —	—	— —	— —
100.0 100.0							

My analyses place beyond any doubt the formula with 40C to be the right one, and the following experiments give further evidence :

The analyses of the double-salt with chloride of platinum are in favor of the formula with 40C. Liebig found 26.5, 26.6 and 26.6 p. c. platinum. Laurent and Gerhardt 26.3 to 26.6 p. c. The formula $C_{40} H_{24} N_2 O_4 + 2H Cl + 2Pt Cl_2$ wants 26.9 p. c., but the formula $C_{38} H_{22} N_2 O_4 + 2H Cl + 2Pt Cl_2$ 27.4 p. c. platinum. The addition of water to the formula, as Laurent did, reduces the amount of platinum, but there is no evidence at all of its containing such.

As further proof of the selected formula, I may mention the following analyses :

Nitrate of Quinine. If the officinal sulphate of quinine is mixed with nitrate of baryta, and the resulting solution evaporated spontaneously, large transparent prismatic crystals are formed, which were recrystallized from boiling water. 0.5865 grm. air-dry crystals lost, at 100° Cent. 0.0245 grm. water. 0.2726 grm. dried at 100° C. gave 0.6205 grm. carbonic acid and 0.1615 grm. water, which leads to the following formula : $C_{40} H_{24} N_2 O_4, HO, NO_3 + 2HO$.

		Calculated.		Found.
40 equiv. C	- - -	240	62.0	- - - 62.1
25 " H	- - -	25	6.5	- - - 6.6
3 " N	- - -	42	—	- - - —
10 " O	- - -	80	—	- - - —
		387		
2 " HO	- - -	18	4.4	- - - 4.2

I could not obtain another nitrate in crystals with more nitric acid.

Sulphate of Quinine. The officinal sulphate contains 7 equiv. (Regnault) of water of crystallization; according to Robiquet 8 equiv. Owing to its efflorescence on exposure to the air, it is difficult to obtain it at all times with the same amount of water. After exposure to dry air it retains, according to Robiquet, still 2 equiv. of water, which statement I can confirm as results of my experiments. For this reason it seems to me proper to consider the effloresced salt as the officinal, as this only might in the shops be found of the same composition.

L. 1.9285 grm. air-dry salt lost, at 120° C., 0.0895 grm. water.

II. 2.0910 grm. air-dry salt, of another crystallization, lost, at 120° C., 0.0965 grm. water.

III. 1.1415 grm. dried at 120° C., formed 0.3575 grm. sulphate of baryta.

IV. 0.7915 grm. dried at 120° C., gave 0.2500 grm. sulphate of baryta.

The formula of the air-dry salt is, accordingly, $C_{40} H_{24} N_2 O_4$, HO, $SO_3 + 2HO$.

	Calculated.		Found.	
	III.	IV.	I.	II.
$C_{40} H_{25} N_2 O_4$	333	89.3	—	—
SO_3	40	10.7	10.7	10.8
	<hr/>			
	373	100		
			I.	II.
$C_{40} H_{25} N_2 O_8 S$	373	95.4	—	—
$2HO$	18	4.6	4.6	4.6
	<hr/>			
	391	100		

Nitrate of Silver and Quinine. On addition of nitrate of silver to an alcoholic solution of quinine, the formation of a crystalline precipitate takes place which, after being washed with alcohol, is dissolved in boiling water. On cooling, the solution thickens to a paste-like mass, in which, after a short time, small colorless crystals are formed, the liquid subsequently becoming thin, like water.

1.2725 grm. air-dry crystals lost, at 110° C., 0.0280 grm. water, or 2.2 per cent.

1.4040 grm. crystals, dried over sulphuric acid, lost, at 110° C., 0.0240 grm. water, or 1.7 per cent.

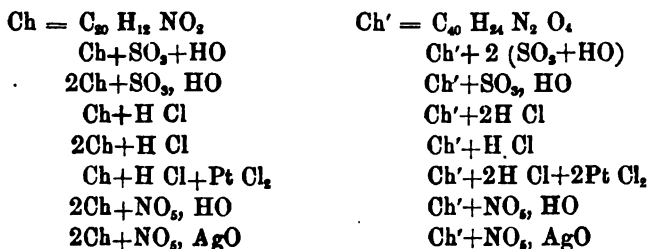
0.7635 grm. salt, dried at $\frac{1}{4}$ 110° C., gave 0.1868 grm. chloride and 0.0265 grm. metallic silver, or 21.6 per cent.

Consequently, the formula of the crystals is $C_{40} H_{24} N_2 O_4 + AgO$, $NO_3 + HO$, from which 1.8 p. c. water, and, in the dry salt, 21.9 p. c. silver is reckoned.

The crystals are sparingly soluble in cold water at 15° C.; 100 grm. water dissolves but 0.35 grm. of them.

After the settlement of the question regarding the composition of quinine, it was still uncertain which was its equivalent. There is much inconsistency displayed regarding the term equivalent;

sometimes it is used to express the weight of equal activity, sometimes to denote the molecule or atom. Thus, the equivalent of phosphoric acid is expressed by PO_5 , while this is equal to 3 equiv. of sulphuric acid, and thus is a sign of 3 equiv. of acid. In the same manner the equivalent of oxide of iron is given as $\text{Fe}_2 \text{O}_3$, and this quantity takes the place of 3 equiv. of potassa or similar oxides, and therefore expresses 3 equiv. of base. If that quantity which may replace 1 equiv. of potassa (KO) is called 1 equiv. of base, the question arises whether the same must be expressed by $\text{C}_{20} \text{H}_{12} \text{NO}_2$, or by $\text{C}_{40} \text{H}_{24} \text{N}_2 \text{O}_4$. For the first value we set Ch , for the last Ch' , then the composition of the most important salts of quinine is as follows :



In inorganic chemistry (which frequently is taken to be the type of organic chemistry) no combinations are known which, for 1 equiv. of base, contain 2 equiv. of chloride of platinum; therefore, most chemists call 1 equiv. that amount of an organic base which unites with 1 equiv. of chloride of platinum to form a double salt. But this does not decide whether chloride of platinum may not combine in other proportions with chlorides and muriates, and some chemists do believe that 1 equiv. of base can unite either with 1 equiv. of hydrochloric acid and 1 equiv. of chloride of platinum, or with 2 equiv. of each. But on the other hand, it is to be remarked as favorable for the second formula, that the salt $\text{Ch}' + \text{SO}_3, \text{HO}$ has a neutral, and the salt $\text{Ch}' + 2 (\text{SO}_3, \text{HO})$ an acid reaction. If the former was a basic salt, as the first theory teaches, it ought to have an alkaline reaction, like quinine, and it is hard to believe that the neutral salt of so strong a base should have an acid reaction, as is the case with the salt $\text{C}_{40} \text{H}_{24} \text{N}_2 \text{O}_4, 2(\text{SO}_3, \text{HO})$.

From the foregoing, it is obvious that chemists come to a dif-

ferent conclusion in accordance with the weight they attribute to one or the other reason, and it might be difficult to decide the question in this way. But the following experiments I believe will much more insure a decision.

(To be continued.)

ON NASCENT MANURES.

By DAVID STUART, M. D.

Chemist of Maryland Agricultural Society.

Reasoning from analogy, all manures must be presented to the plant in the nascent state in order to their assimilation; but a safer proposition, perhaps, would be, that many elements of plants, while they exist in their normal or natural condition, are as perfectly unassimilable, or as incapable of affording nourishment to them, as they are to animals.

A hundred illustrations of this law will at once occur to every intelligent mind; and the facility with which even inorganic compounds unite while in the nascent form, is familiar to all. Every molecule of matter, whether composed of compound or simple atoms, seems to have a form of its own, and until it has assumed this form, or state of aggregation it is in the nascent state, or in an allotropic condition.

While in this nascent state, its tendency to unite with other bodies which have an affinity for it, is wonderfully increased; indeed, it is often the only condition in which two substances will combine. The celebrated Faraday attaches so much importance to this nascent, as contrasted with the normal condition, that a few months since he expressed the opinion that ozone is merely oxygen in the nascent, or allotropic condition.

Lime and Magnesia, when recently slacked, are capable of uniting with other substances; if, however, the slacked lime or magnesia is kept for a long time, even although perfectly excluded from the air, it will gradually assume the form of granules, and subsequently these molecules will form crystals, or the lowest order of organisms; and these organs seem to possess a degree of resistance to external force analogous to the resistance of the higher organisms; indeed, the more perfect crystals of the same

substance and in the same solution, will grow and become more perfect, at the expense of those which are irregular. Upon this principle, the imperfect crystals may be said to be approximating to the allotropic condition, or nascent state, while the perfect crystal is in the normal condition.

It may be said that extent of surface is one of the causes of this, and a better illustration is sand, or quartz, which is perfectly insoluble in its natural or normal condition, however fine the powder, even in some of the strongest acids. But sand or silica is frequently found in the nascent condition, and then it dissolves readily in water; moreover, it can be kept in this condition for years; but if heated to the temperature of 260° it assumes, its normal condition, and becomes perfectly insoluble even in acids; whereas before, it would dissolve in acids, alkalies, or pure water.

Lime and Magnesia, while in the caustic state, are capable of converting sand into soluble silica; and this is perhaps one of the good effects of liming, especially when we consider the remarkable influence that soluble silica exerts in absorbing ammonia from the atmosphere, and also from ammoniacal manures. We may also account thus for the crumbling of stable walls, the moist condition of old walls, and especially those that are exposed to ammoniacal exhalations. Moreover, we have a plausible mode of accounting for nitre beds, and the remarkable value of old plaster; also the purifying influence of "White-washing," if it is done with caustic lime, and not with whiting or carbonate of lime. Lime, while caustic and moist, in contact with sand, converts a small part of the surface of the grains of sand from the soluble to the insoluble silica; and this is the reason why caustic lime is necessary to the formation of good mortar, as it is not (as is almost universally supposed) a mere mechanical mixture of lime and sand, neither is it grains of sand cemented together by the induration of lime, but the actual solution of the surface of the grains of sand produces a still more intimate union.

Well, this soluble silica gradually absorbs from the atmosphere the ammonia, for which it has a remarkable affinity; and as ammonia is the vehicle of poisonous exhalations of disease, as well as the perfume of flowers, these exhalations are so concentrated upon the walls of hospitals, that it sometimes becomes neces-

sary to remove the plastering, in order to get rid of *erisypelas* and other diseases.

Nearly, or quite all of the nitric acid of commerce, was no doubt originally derived from ammonia in the order above referred to, for, if my theory as above stated is admitted, then, every authority will sustain me in saying that old plaster contains ammonia, and this ammonia is converted into nitric acid on the wall. Salts of nitric acid can be seen by any one on the surface of old walls. Moreover, the leachings of old walls have frequently been used in the manufacture of gunpowder, and old plaster always enters into the composition of artificial nitre beds.

It will be readily admitted that silica can never enter the rootlet of a plant, however fine the powder, unless it is in solution, and that the finest powder of sand or silica differs as much in solubility from nascent silica, as sand differs from sugar. The importance, then, of soluble silica to grasses and wheat, and especially to corn, and, indeed, its value as manure has long been recognized; (see Liebig's Chemistry, Am. Ed. 1841, p. 200.)

It was first supposed that potash was the vehicle for its conveyance to every part of the plant; but the modern idea is, that ammonia is the main instrument of its conveyance; certain it is that it loses its base at the instant of its deposition on the stem; and if potash were the base, then it would be necessary that the potash be carried back again to the earth, and the plant would be constantly embarrassed by excrementitious matter; whereas, the ammonia being volatile evaporates, and leaves the glassy coating, or element of strength, on the surface of the stem. Thus, it is found that more ammonia is actually exhaled from plants, than we ever give them in the form of manure; and it is strongly suspected that soluble silica is really the manure, while ammonia is merely the vehicle for the conveyance of soluble silica through the plant.

When the carcass of an animal falls in a field, the luxuriant grass or grain "falls," on account of the absence of the relative amount of soluble silica, or the excess of ammonia uses up at once all of this necessary element that is available.

Two years since, I manured two lands in the centre of my oats field, the one with Peruvian Guano, the other with soluble silica,

leaving a land unmanured between. The proportion of straw on the guanoed land was very much increased, but last summer, the same field was in wheat, and a corresponding diminution in the proportion of straw was noticed on the land that had been guanoed two years since; and what is more remarkable, the lands on each side of the guanoed land, averaged 746 lbs. more of wheat straw per acre, although no manure of any kind had been applied to either since it was in oats. Whereas, the silicated land not only produced more straw than either of its unmanured neighbors, but also excelled the guanoed land in wheat nearly three bushels per acre, and ripened earlier than any other part of the field.

The difference between the silicated land and the unmanured, averaged 1966 lbs., while it also produced nine and one tenth bushels of wheat more than the adjoining unmanured lands.

A land of my oats field of last summer, exhibited the same increase in the weight of the straw, although no silicates have been applied since it was in corn two years since.

But the most remarkable result was obtained in my corn field of this year, where the corn on the silicated portion averaged 93 lbs. per shock, while the part unmanured only weighed 42 lbs. per shock; each shock represented 64 hills of corn, and the average of 31 shocks was taken. This manure was applied in my presence, and I personally gathered and weighed the produce of each separate shock in the field, with my own hands; therefore, I can vouch for the correctness of the results. And now, can we not account for the well known and remarkable efficacy of dissolved bones on this principle, when compared with normal phosphate of lime, whether it be in the form of bone-ash, ground bones, or phosphate guano?

"Bones have been used with profit, at the rate of \$20 to \$60 per acre;" and it has been repeatedly demonstrated that one bushel of dissolved bones, for immediate effect, is equal to five times as much ground bones; in other words, that one pound of nascent or soluble phosphate of lime, is worth more than five pounds of normal or natural phosphate of lime, or bone earth. It will be admitted that every acre of land on the face of the earth, contains from one-tenth of one, to 4 per cent. of lime, and magnesia; and if only *one*-tenth of one per cent, at the depth of cultivation, even then, each acre must contain 1500 to 2000 lbs. of

lime and magnesia. Now, it is manifest if 10, or even 30 bushels of dissolved bones were applied to the acre, the first rain would convert all of the free phosphoric acid, or bi-phosphates that they contain, into neutral nascent sub-phosphates; and it is, therefore, nascent sub-phosphate of lime, that is taken up and assimilated by the plant. Thus, we are enabled to account for the wonderful effects of what are called in commerce, bi-phosphates, which really contain very little free phosphoric acid, but all of the phosphoric acid exists as neutral nascent phosphate of lime.

The fact is, that dissolved bones are unmanageable as a manure in this country, [in England bi-phosphates are applied in solution,] until reduced from a fluid to the form of a powder, by the means of ivory black, guano, or some less valuable diluent; and the universal distribution of carbonate of lime, etc. in these, converts nearly all of the bi-phosphates into neutral nascent phosphates or sub-phosphates. During the past summer, I have been experimenting on two separate fields, with four of these compounds, two of which were made in New York, and two in Baltimore; the most remarkable results were obtained from experiments made upon a few hills of corn. But I will confine my statement to two series, where whole rows of shocks were compared with contiguous unmanured rows; the average of 23 shocks, each shock representing 64 hills, exhibited a difference of about 25 per cent; or the manured 42 lbs. per shock; and these manures were applied in my presence, at the rate of ten bushels per acre broadcast, and I gathered and weighed the corn in the field myself.

Now, it is most probable that no atom of free phosphoric acid, or bi-phosphate of lime, ever enters the rootlet of a plant without destroying it; and, having proved that a solution of bones would necessarily become precipitated in contact with any soil, we are driven to the conclusion that this precipitate or nascent sub-phosphate is *the* valuable manure, and we take it for granted that it will preserve the nascent form for some time in moist situations, as we know that moist oxide of iron will continue to preserve this form, as the antidote for arsenic, for weeks together. Ultimately, however, it also loses the nascent and assumes the normal form, and becomes so insoluble, that five times the dose is required, in order to afford the soluble material for the same proportion of ar-

senic. Thus it is with phosphate guanoes and bone dust; none of them are absolutely insoluble in pure water, and when thus dissolved as sub-phosphates, they are converted into the nascent form, and more readily redissolved than before their solution.

The contact of a piece of wood or string, has been known to hasten the solubility of the most insoluble substances; for instance, the inner part of a metallic worm of a still, opposite a wooden support has been known to dissolve in the distilled waters passing through it, and the same remark is made with regard to hydrant pipes; the normal condition of insoluble bodies is then disturbed, and the allotropic or nascent condition produced, by contact with vegetable substances in a state of change; this, then, may account for the influence of organic manures, and indicates the philosophy of the modern plan of manuring in Europe, which is by hauling out the manure on the field, load by load, as it is generated, instead of permitting it to ferment in heaps in the stable yard. Now, query, would it not be still better to stratify it with powder of feldspar, phosphorite, or phosphatic guano, and concentrate this disturbing force of fermentation upon the elements, which, when reduced to the nascent state, are worth more than the one or two per cent. of, alkalies, etc. in the manure itself.

It is still a question with physiologists whether nitrogen is ever assimilated by plants, much less by animals, in its normal condition; and it is a curious fact, that both the plant and animal may starve, when fed on carbonaceous food exclusively, although both are bathed in an atmosphere containing four-fifths of nitrogen, which is perfectly useless to both, because not presented in the nascent form.—*American Farmer*.

Baltimore. Jan. 24th, 1855.

ON THE PRODUCTION OF OPIUM IN ASIA MINOR.

BY SIDNEY H. MALTASS, Esq.

No crop is more uncertain than opium, as the poppy from which it is produced is liable to be injured, and even destroyed by spring frost, drought, or locusts. Winter snows and a mild rainy spring are most favorable to its growth. The poppy requires a naturally moist and rich soil, further improved by large

quantities of manure : the fields in which it is grown are repeatedly ploughed until the soil is completely pulverized. The seed is sown immediately after the first autumn rains until November, and in the highlands even later. It is sown broadcast mixed with sand, to avoid throwing too large a quantity. A *toloom* or hide of land (1600 square yards) requires from one-fourth to one third of an *oke*, that is about three-fourths to one pound weight of seed. After the seed is sown, a harrow peculiar to Turkey is passed over the field ; this harrow consists of planks nailed together, forming a square of about four feet, to which are harnessed one or two oxen ; a man stands upon it, and drives the team over the field.

Early in the spring, when the plants have acquired some strength, hoeing and weeding commence, and continue until the flowering season ; this occupation devolves principally on the women and children, who are all employed. It is not customary for large landed proprietors to grow opium, nor would it pay them, on account of the difficulty they would experience in procuring laborers on hire. Every peasant either possesses or rents as much land as he and his family can cultivate, and grows opium on his own account. About the end of May the plants arrive at maturity, and the flowers expand ; they are mostly single, and either white or purple. A few days after the petals have fallen, the head or capsule is ready for incision. In this operation the whole family commonly take part ; it is performed in the afternoon of the day, and in the following manner : A transverse incision is made with a knife in the lower part of the capsule, the incision being carried round until it arrives nearly at the part where it commenced ; sometimes it is continued spirally to half-way beyond its starting-point. The greatest nicety is required to avoid cutting too deep, and penetrating the interior coating of the seed vessel, as this would cause the sap or milk to flow into the inside. The following morning the capsules are scraped and the inspissated juice placed on a leaf ; if the dew has been heavy during the night the yield is greater, but the opium is dark in color ; if on the contrary there has been no dew, then the yield is less, but the opium is of a lighter color. A high wind is prejudicial, as the dust raised from [the pulverized soil adheres to

the exudation and cannot be separated. The poppy capsules are cut but once, but as each plant will from one stem produce several branches, and each branch produces a flower, it is usual to pass over the field a second or a third time, to cut such capsules as were not ready at the first cutting.

The average yield of a *toloom* of land may be stated as $1\frac{1}{2}$ *chequees* of opium ($21\frac{3}{8}$ lbs.) and four bushels 50 lbs. weight of seed; 3 to 5 *chequees* per *toloom* is considered a good and full crop, and under very favorable circumstances a yield of even $7\frac{1}{2}$ *chequees* has been known. The amount produced is, however, exceedingly variable, as the following report of the actual yield of one *toloom* of land in four different years will show:—

1st year, one <i>toloom</i> produced, of Opium,	$7\frac{1}{2}$ <i>chequees</i>
2nd " " "	$\frac{1}{2}$ <i>chequee</i>
3rd " " "	$2\frac{1}{2}$ <i>chequees</i>
4th " " "	$4\frac{1}{2}$ <i>chequees</i>

After the opium is collected, the capsules are gathered and the seed shaken out and carefully preserved: the plants, or as they are termed the *straw*, being then given to the cattle. The seed is afterwards pressed in wooden lever-presses and the oil extracted; this oil is used by the peasants, not only for burning, but also for culinary purposes. The cake is given partly to cattle, and partly consumed by the poorer families, who pulverise it and mix it with their bread. A portion of the seed is also sold to Smyrna merchants, who ship it to Marseilles, where it is converted into oil for soap-boilers. This oil is also used as a substitute for that of linseed. The poppy seed is black, brown, yellow, or white; some districts produce more white seed than others, and it is considered to yield more oil. The average render of oil is 35 to 42 per cent.

After the opium is collected, it is wrapped in poppy leaves and dried in the shade. Before it is ready for market, a meeting of buyers and sellers takes place before the *Mudir* or Governor of every district, and the price is discussed and fixed, or as it is technically expressed *cut*, to the satisfaction of both parties—this price not being *binding* to either. The buyers or merchants advance money to the peasants at an exorbitant rate of interest, usually 4 per cent. per month; as the Turkish law does not re-

cognise more than 8 per cent. interest of money, and none at all when advanced against produce, the interest is added to the amount of the bond. The peasants are not bound to give their opium to their creditors provided they can find buyers at a higher price than that fixed, nor are the merchants compelled to take opium at the fixed rate if no one will take it off their hands.*

The duties levied are heavy: 10 per cent. are paid by the peasant for tithes, 9 per cent. by the buyer on arrival at a shipping port, and 3 per cent. more when shipped.

After the opium is purchased in the interior, it is put into thin cotton bags (which are sealed,) and these bags into circular baskets, 80 to 100 cheques (130 to 162 lbs.) being the usual weight of each; to most of these baskets a proportion of *Chicantee* or inferior adulterated opium is added, usually about 5 per cent.; this *Chicantee* is opium mixed with sand, pounded poppy capsules, half-dried apricots, and in some instances turpentine, figs or gum tragacanth of inferior quality. The baskets are then sent to Smyrna, two on each mule, and upon arrival are stowed in damp warehouses, to avoid loss of weight; they are sold without being opened, and it is only when they reach the buyer's stores that they are opened in presence of the seller and of a public examiner.

The examiner then seats himself on the ground with an apron on and armed with a strong knife, an assistant emptying the baskets of opium before him; he then examines it piece by piece.

*[NOTE BY MR. WILKIN.]—Money is advanced to the opium growers upon the security of standing crops, and it is stipulated in the bond that when the produce is collected the debt must be liquidated, either in money or produce, at the opening prices—it being optional on the part of growers to refund in money or produce. It is usual when crops have been collected, for the authorities to call a meeting for the express purpose of fixing, or as it is termed, *cutting* the prices, at which meeting growers and buyers are present. Supposing the price named at the meeting does not meet the approval of growers; but that the latter are not prepared to pay up in money, then buyers of their produce, at a higher rate than that proposed, must be forthcoming, who will engage at once to take the produce and redeem the bonds, otherwise they (the growers) must submit to the prices offered by their creditors. In the event of any competition, however the parties who have made advances are entitled to the preference, at the prices actually fixed at the meeting.

By constant practice, he can usually tell by the weight if the opium is pure, but any suspected piece is immediately cut open, and if bad thrown aside as *Chicantee*; sometimes *Chicantee* is thrust in between two pieces of good opium, and it is then cut out and thrown aside: about ten minutes are required for the examination of each basket.

The strength and quality of opium are reckoned in *carats*, like gold, 24 carats constituting pure opium; but according to custom, the examiner must pass as pure any which reaches 20 carats; all below that standard is thrown out as *Chicantee*. In purchasing opium, therefore, a difference of 20 per cent. may exist between the value of one basket and another, unless a previous examination be stipulated for on effecting a purchase. This condition is, however, seldom exacted when opium is intended for re-sale, as no difference of price is made in any European market for a difference of quality to this extent.

After the opium is examined, the tare is taken, including the chaffy seeds with which it was packed; these seeds, which are those of a species of *Rumex* called *Afion Oto*, or opium weed, are afterwards returned to the buyer to pack his cases. The cases are made large enough for the contents of one basket each, excepting those intended for China, which are two-thirds of the size, to facilitate their carriage across the desert to Suez.

I have observed that in London a distinction is made between Constantinople and Smyrna opium. No real difference exists. Some of the upper opium districts being at equal distances from Smyrna and the capital, the merchants who purchase in the interior send their opium to either city for sale. As Smyrna offers more advantages for smuggling, no opium has been sent to Constantinople for the last two years.

I observed, also that Landerer discovered salep powder mixed with opium shipped from Smyrna. Although I have no right to contradict so good an authority, I would suggest that the substance so discovered may have been common gum tragacanth, which is frequently used by the Jews in Smyrna, in the adulteration of opium; in fact, it is the principal substance they employ, and is cheaper than salep, and more easily procured. They make no secret of their method of adulterating, but they deny using salep, which, according to them, would be too expensive,

even at its present reduced price, and would, besides, be much more readily detected. The purest opium is collected at Ushak, Bogaditz, and Simav; but the pieces are small and stick together, which makes it unsightly.

Karahissar and its environs produce one-third the annual crop, but the quality is not so good, and the pieces are usually larger.

For the following statement of crops in different districts, and the expense attending the cultivation, &c., I am indebted to Mr. Wilkin, a gentleman who has passed several years in the opium districts, and who is well acquainted with the languages of the country.

Subjoined is a list of the opium districts, with their amount of produce in two different years—one a full crop, the other a good average, the former about 3000 baskets, and the latter 2200. Last year (1853) the crop was only 1000 baskets, and this year it is but 600.

The following is an approximate statement of the expenses which would attend the cultivation of opium by paid labor, which gives an idea of the average cost of this drug:—

Estimate of Two Crops of Opium.

		Good fair crop.		Full crop.	
		400 baskets	500 baskets.		
Karahissar district.	Karahissar	50	100	"	"
	Afion Cassaba	200	250	"	"
	Sandukli	60	80	"	"
	Sitchanli	25	30	"	"
	Karamuk	30	40	"	"
	Tzai	50	60	"	"
	Bolavadin	250	400	"	"
	Ushak	100	200	"	"
	Ishikli	100	200	"	"
	Ekmé, Takmak, Coullah	80	100	"	"
	Tzal, Baklan	200	250	"	"
	Simav, Ghediz, Eneövassi, Taouchanli	40	50	"	"
	Kutayah	30	50	"	"
	Boladitz, Eskihissar	250	300	"	"
	Ak Shair	250	300	"	"
	Yalavatz	150	200	"	"
	Karagatz, Sparta, Bourdroun				
		2265	3110		

Calculation of the average expense and result of cultivating 100 Tolooms of land with Opium, provided labor could be procured by usual wages.

PRODUCE.		Piasters.
100 Tolooms of land—average yield of opium at $1\frac{1}{2}$ <i>chequees</i> } per toloom=150 <i>chequees</i> , at piast. 80 . . . }		12,000
Average yield of seed, 4 bushels per toloom=400 bushels, } at P.* 20 }		8000
		<hr/> 20,000

EXPENSES.		Piasters.
Tithes, 10 per cent. on value of produce		2000
Ploughing, 118 days, at p. 8		944
Manure, 5000 loads (donkey) at p. 1 per load		5000
Seed, 36 <i>okes</i> or 2 bushels, at p. 20		40
Hoeing, weeding, &c., 400 days, at p. 8		3200
Making incisions . 200 " p. 8		1600
Gathering . . 100 " p. 8		800
Collecting seed . 100 " p. 8		800
Cleaning . . 100 " p. 8		800
Cattle food, &c.		240
		<hr/> 15,424

Average gain to a grower 4,576

The foregoing statement regarding the expense of cultivating the poppy and its yield of opium in various years, must be regarded as *approximative* only, as it has been obtained from ignorant peasants, who are never exactly correct, especially in figures. In Turkey there are *favorite* numbers amongst the peasants, 100 and 40 being those mostly used; 10, 20, and 5, are also favorites.

Presuming the grower should send this opium to Smyrna for sale, the cost would be as follows:—

	Piasters.
150 <i>Chequees</i> , at piast. 80	12,000
Packing charges	20
Inland duty at p. 5 1-10th per <i>chequee</i>	825
Carriage	300
Loss on money by bills, 2 per cent.	240
Factor's commission in Smyrna, 2 per cent.	200
Brokerage 1 per cent. on p. 100	100
	<hr/> 13,685

* "P." signifies *Piaster*. A Turkish piaster is worth about 2 1-5thd. sterling.

This shows a cost of p. 91.23 per chequee,
to which add . 9.00 " shipping charges to Europe

P. 100.23

Or, at the exchange of 110 piasters for £ sterling and usual equivalent per *chequee* of $1\frac{2}{3}$ lb avoird., it would cost 11s. 1d. per lb. free on board ; add charges in England, insurance, freight, &c., 5d. = 11s. 6d.

This year (1854) the crop of opium being only 600 or 800 baskets, the price at present (October, 1854) is p. 140, or 16s. 2d. per lb. on shipboard ; but were it not for the revolution in China, which diminishes the demand for that country, the price would be fully 20s.

The average price of opium in Smyrna is p. 100 per *chequee* of $1\frac{2}{3}$ lbs. ; to this added for commissions and duties, &c., 9 per cent., would give an average value in sterling of 12s. per lb. on board ship. The exchange on London varies from p. 110 to p. 115 per £ sterling.

This price of p. 110 must be reckoned when the crop is fair, say about 2000 baskets ; an increase on this quantity would reduce prices below p. 100, until a crop of 3000 would make prices fall to p. 60 per *chequee*, or about 7s. 2d. per lb., including shipping charges.—*London Pharm. Journal*, March, 1855.

ON THE PRODUCTION OF ALCOHOL FROM BICARBURETTED HYDROGEN GAS.

By M. BERTHELOT.

I. 1. A large balloon, capable of containing 31 or 32 litres, was filled with pure bicarburetted hydrogen gas ; 900 grms. of pure boiled sulphuric acid were then added in several portions, followed by several kilogrammes of mercury, and the whole was then violently shaken for a long time. The gas was gradually absorbed. After 53,000 shocks, the absorption becoming very slow, the operation was stopped ; 30 litres of the gas were absorbed. 5 or 6 vols. of water were added to the sulphuric acid, and this was distilled ; by repeated distillations and separations by means of carbonate of potash, 52 grms. of alcohol were at last obtained, representing 45 grms. of absolute alcohol. This

weight represents three-fourths of the absorbed gas. The remainder was lost in the manipulations.

2. This alcohol presents a somewhat pungent and aromatic spirituous taste and odor, similar to that which is met with in the distillation of the sulphovicates. It distills almost entirely between 174° and 178° F. It burns without residue, with the usual flame of alcohol. It dissolves chloride of calcium in abundance, and mixes with water in all proportions.

3. A quantity of this alcohol corresponding to 8.1 grs. of absolute alcohol, distilled with sulphuric acid and sand, furnished 1.5 litre of gas containing 1.25 litre of pure olefiant gas, that is to say five-sixths of the quantity of olefiant gas represented by this weight of alcohol. These results agree with those furnished by ordinary alcohol.

The olefiant gas thus prepared possesses the normal properties; it is absorbed by ordinary sulphuric acid (3000 shocks), by bromine, and by iodine, forming the characteristic solid iodide. When collected at the proper moment, it furnished by detonation 2 vols. CO_2 , absorbing 3 vols. of oxygen.

4. 10 parts by weight of my alcohol (regarded as absolute alcohol) distilled with a mixture of sulphuric and acetic acids, furnished 20 parts of crude acetic ether. Calculation gives for 10 parts of alcohol, 19 parts of anhydrous acetic ether. This ether, treated with potash at 212° F., was rapidly decomposed, reproducing acetic acid and alcohol, with a perfectly normal odor. The alcohol was reconstituted in this manner for the third time.

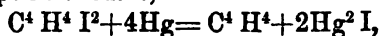
5. These characters appear to leave no doubt as to the nature of the liquid prepared with olefiant gas. To arrive at greater certainty, the experiments were varied as follows:—

1. The olefiant gas was collected in a gasometer filled with concentrated sulphuric acid. The gasometer, still containing a fourth of the sulphuric acid, was quickly shaken for several minutes; the gas was then passed through mercury into bottles of a litre capacity, and absorbed by boiled sulphuric acid. The complete absorption of the gas required 3000 shocks to each bottle.

2. Olefiant gas, collected and purified in a gasometer filled with sulphuric acid, was passed slowly through fuming sulphuric

acid contained in a Liebig's tube. A portion of the gas escaped the action of this fluid, and this portion was absorbed by shaking with ordinary sulphuric acid.

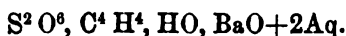
3. Olefiant gas was prepared by the action of mercury and muriatic acid upon its iodide,—



and the gas was absorbed by sulphuric acid.

The sulphuric acid combined with the gas in each of these three operations, was saturated by carbonate of baryta or lime; in this manner sulphovinates were produced.

6. The baryta salt analysed presented the ordinary composition,—



Judging from its properties and crystalline form, this salt is identical with the variety of sulphovinate of baryta which is stable at 212° F.

7. When distilled with acetate of soda, it furnished acetic ether; with butyrate of potash, butyric ether; with benzoate of potash, benzoic ether, $\text{C}^{14} \text{H}^6 \text{O}^4$, $\text{C}^4 \text{H}^4$. The latter boils at 410° F. It was analysed. Treated with potash at 212° F., it reproduced benzoic acid and alcohol. Benzoic ether was also prepared with salts produced by each of the three preceding operations.

8. The fuming acid employed in the second operation furnished a stable and deliquescent calcareous salt (isethionate), which did not yield to benzoic ether. This last observation confirms those of M. Magnus.

9. 100 litres of coal-gas were treated with iodine, and the product obtained heated with a watery solution of potash. In this manner about $\frac{1}{4}$ litre of pure olefiant gas was obtained, which produced by its combustion 2 vols. CO^2 , absorbing 3 vols. of oxygen. This gas was absorbed by sulphuric acid by means of 3000 shocks; it furnished crystallized sulphovinate of baryta, and afterwards benzoic ether; the latter, treated with potash, reproduced benzoic acid and a substance possessing the properties of alcohol.

Bicarburetted hydrogen, therefore, whatever may be its origin, produces ethers and alcohol. This is the first time that alcohol has been obtained without the agency of fermentation.—*Chem. Gaz., Feb. 1855.*

ANALYSIS OF THE TUBERS OF THE CHINESE POTATO (*DIOSCOREA BATATAS*), CULTIVATED NEAR PARIS DURING THE YEAR 1854.

By E. FREMY.

The tubers analysed had the following composition :—

Water . . .	79.3		
Solid matters	20.7	{ Starch	16.0
		{ Cellulose	1.0
		{ Mineral salts	1.1
		{ Albuminous matter	1.5
		{ Fatty bodies, sugar, soluble principles	1.1
	100.0		20.7

M. Boussingault had made a previous analysis of tubers grown at the Museum, and M. Payen of tubers from Algeria. The following are the results of these analyses :—

	Cultivated at the Museum.	Cultivated in Algeria.
Starch and mucilaginous substance	13.1	16.76
Albumen and other azotized matters	2.4	2.54
Fatty matters	0.2	0.30
Cellulose	0.4	1.45
Mineral salts	1.3	1.90
Water	82.6	77.05

By comparing these results with those of the analysis already given, it will be seen that the plants cultivated in France are actually approaching those grown in Algeria. The proximate principles of which the tubers are composed are to a great extent the same as those existing in the potato.

The Chinese potato only contains 16 per cent. of starch, whilst the potato may furnish 20 per cent. ; the former, however, possesses a very remarkable azotized principle, which is not met with in the potato, and which may exercise a favorable influence upon the use of this valuable tuber. The mucilaginous principle which gives its unctuous properties to the juice of the *Dioscorea Batatas*, and which causes the pasty consistence assumed by this tuber when cooked, differs in its general properties from the gummy vegetable substances, and approaches albumen, being azotized and coagulable by heat.

This body must not be confounded with that which is often

designated as *vegetable albumen*; it does not coagulate until after long boiling, and remains in great part in a soluble state in tubers which have been boiled or dried, even at a tolerably high temperature. Thus, the Chinese potato, when cut into thin slices and dried on a stove, furnishes a product which may be reduced to powder, and which when treated with water forms a paste resembling in its plasticity that produced by wheat-flour.—*Chem. Gaz.*, Feb. 15, 1855, from *Comptes Rendus*, Jan. 15, 1855, p. 128.

ON A NEW VARIETY OF COCHINEAL—CAKE COCHINEAL.

(Obtained from Cordova, the Argentine Republic, South America.)

By JAMES STARK, M. D., F. R. S. E.

My brother-in-law, Mr. Charles Bertram Black, when lately on a visit to some parts of the Argentine Republic, South America, had his attention directed to a dye stuff, or coloring matter, which the natives of Cordova consider of great value, and employ for dyeing cloths of all shades of red. Imagining that the substance was unknown here, and that it might be profitably imported for use in the Arts, Mr. Black procured a small quantity of it, and sent it to James Richardson, Esq., of this city. The whole information given regarding it is contained in a letter addressed to me, and dated "Santiago, April, 1854." After stating that the cake sent is a substance used for dyeing cloth all kinds of red, he says, "It is the gum which exudes from a species of cactus like the prickly pear. If Mr. Richardson thinks he can make an advantageous article of commerce of it, I can make all the necessary arrangements for him with a collector. The dye costs from 4*d.* to 9*d.* the ounce, according to the vicinity to the place where it is found."

The dye stuff, as sent home, is a solid flat cake, about a quarter of an inch thick, of a deep red color, and is marked on its surface as if it had been subjected to pressure between folds of coarse linen. The cake broke with a jagged fracture, and over the surface were seen occasional whitish spots, resembling imbedded fragments of the silver variety of the cochineal insect. A few of the strong thorny prickles of the cactus opuntia, or some similar species, were also seen projecting from the broken edges.

When a portion of the red cake was macerated in water, it swelled but did not dissolve, and then gave out a deep beautiful red color, absolutely identical with that yielded by cochineal to water. This colored solution yielded a beautiful carmine when treated with alum; in fact, this dye stuff gave all the reactions which cochineal gives, so that the two solutions, when treated by similar reagents, could not be distinguished the one from the other. When endeavoring, however, to ascertain the relative amount of coloring matter yielded by this dye stuff, and by cochineal, it appeared that it required nearly a sixth more of the red dye cake to produce a color equal to that yielded by cochineal. In other words, the cake appeared to be a sixth weaker in coloring matter than cochineal.

On examining, by means of the microscope, the solid residuum left undissolved by the water, it was found to consist almost entirely of the bodies of the cochineal insect in various stages of development. Some were nearly as large as a split pea, and were full of ova. In a few the eggs had become developed, and the mother cell, or mother insect, was left as a more or less shrivelled skin, full of perforations, through which the young had probably escaped. In both of these the color of the body appeared dark, nearly black; there were no silvery markings observable on the rings, like those seen on the silver cochineal. Fewer in number than either of the above, there occurred other cochineal insects identical in every respect with the common cochineal of commerce. Most of these were quite dark, resembling the black cochineal; others again had the silver markings as occurs in the most esteemed variety of cochineal—the silver cochineal. The bodies of the female coccus, full of ova, were by far the most common of the above; and probably from the whole having been pressed into a cake while still soft, most of the bodies were burst, and the ova, and also very minute but perfect young of the coccus, had escaped, and were floating in the water.

The presence of a few of the strong thorny spines of the cactus was evidently attributable to carelessness in gathering; and there were also observed several small fragments of the skin of the leaf of the cactus, evidently scraped off along with the insects.

The red dye cake was, therefore, nothing else than a cake of cochineal insects, collected when the females were full of ova, but also containing others in which the ova had become developed, and escaped from the mother-cell or insect. This latter fact at once accounted for its inferiority to cochineal itself as a color-producing agent. It is a well-known fact, relative to the whole of the insects which furnish cochineal, lac, and kermes, that the largest quantity of coloring matter is yielded by the mother insect before the eggs are fully developed, and that little coloring matter is yielded by those in which the eggs are fully developed or are hatched. As this cake cochineal contained a considerable proportion of females in which the ova were arrived at their full development, and several were even hatched, this satisfactorily accounted for the smaller proportion of coloring matter which the cake yielded.

We are informed that this cake cochineal—for so, I think, it may be safely termed, cost in Cordova from 4*d.* to 9*d.* the ounce; that is, from 5*s.* 4*d.* to 12*s.* the pound. As the best cochineal can be bought here for about 4*s.* the pound, this fact at once settles the question as to the profitable introduction of this red cake to this country as an article of commerce.

After the above details it is unnecessary to say that this substance is not a gum, nor an exudation from a prickly pear (or cactus) as Mr. Black has been informed it was by the native collectors. Had it been so, it would probably have been a new dye-stuff, and might have proved of much value to commerce. As it is, I think this Society will agree with me, that Mr. Black deserves the thanks of the mercantile public for bringing under their notice a dye stuff which might have been both new and valuable.—*London Pharm. Jour. Feb. 1855.*

RELATIVE FUEL-VALUE OF ALCOHOL AND WOOD-SPIRIT.

Bolley has made some comparative experiments to ascertain this point.

The wood-spirit used was slightly yellow and empyreumatic; the density was 0.81; it began to boil at 154°.4 F., and then the boiling-point rose gradually. It had a slight acid reaction, and

the color became darker on the addition of caustic soda or sulphuric acid.

The alcohol had a density of 0.845.

The apparatus employed for these experiments consisted of a lamp for the combustion of the spirit, the burner being surrounded by a cylinder eight inches in diameter, and a light brass pan supported above the flame for holding the water to be evaporated. Each experiment extended over about two hours. In each, the true quantity of water evaporated and quantity of spirit burnt were observed. The quantity of water, at 212° F., remaining in the pan was likewise observed, the quantity of steam that would have been produced by the heat thus consumed calculated, and added to the quantity of water evaporated. One fraction of the effect—the heat consumed in raising the water from 62° to 212° F.—is not included in the table below:—

	A.	B.		
	Consumption of fuel in grammes.	Evaporation of water in grammes.	Ratio of B to A.	Duration of experiment in minutes.
Wood-spirit	1. 98	514°	5.25	101
	2. 133	697	5.25	149
	3. 124	597	4.81	138
	4. 198	782	3.95	165
Alcohol	5. 160	580	4.25	104
	6. 178	781	4.38	148
	7. 133	590	4.43	119
	8. 159	687	4.32	170

In the experiments 1, 2, 3 and 6, 7, 8, the distance between the bottom of the pan and the level of the wick was always the same. In order to ascertain the influence of the greater elevation of the pan, it was raised in experiments 4 and 5 about three-quarters of an inch further from the flame. The result showed a loss in this case.

According to the first three and last three data, the heating capabilities of alcohol and wood-spirit are as 48 : 50, or nearly 6 : 7. The prices however were as 8 : 6 ; consequently the cost of evaporating a given quantity of water by means of alcohol would amount to 56, while with wood-spirit it would be only 36 ; or wood-spirit, under such circumstance, would be nine-fourteenths cheaper fuel than alcohol.—*Chemical Gazette*, February, 1855, from *Schweizerisches Gewerbeblatt*, June 1854.

ON THE PREPARATION OF PURE CARBONATE OF POTASH.

By M. BLOCH.

With the view of avoiding the trouble of purifying the cream of tartar and the destruction of an equivalent of tartaric acid in the preparation of pure carbonate of potash, the author has employed the following method.

The bitartrate of potash is boiled with its equivalent of carbonate of lime. The liquid is filtered, and a few drops of nitric acid are added to it; the contained chloride is then precipitated by a few drops of nitrate of silver. The liquid is then passed through a filter moistened with water acidulated with pure nitric acid, evaporated to dryness in an iron pot, and the residue exposed to a red heat. A little water is sprinkled on the red-hot mass, in order to decompose the cyanide which has been formed. It is advisable to keep the materials constantly stirred, in order to equalize the reactions and obtain a homogeneous mass. The whole is then treated with pure water, filtered, and evaporated to dryness.

The carbonate thus prepared is perfectly pure; and contains no trace of chloride, a body which it was exceedingly difficult to get rid of by the old methods. The other advantage attending it is, that an equivalent of tartaric acid is obtained from every equivalent of bitartrate of potash employed, being thrown down in the first instance in the form of insoluble tartrate of lime.—*London Chemical Gazette, from Comptes Rendus*, Feb, 12. 1855, p. 364.

ON THE ACTIVE PRINCIPLE OF CENTAUREA CALCITRAPA.

By L. COLIGNON.

Centaurea calcitrapa exhibits a powerful febrifuge action. The author has endeavored to prepare its active principle. This however is not an alkaloid, and cannot be obtained in a crystalline form. It has an intense and styptic bitter taste, has a transparent amber color, and a syrupy consistence; it is not volatile, is decomposable by heat, strongly reddens litmus-paper, dissolves readily in alcohol and ether, but is only sparingly soluble even in boiling water; with potash, soda, and ammonia it forms soluble but uncrystallizable salts, and with lime and oxide of lead insoluble salts.

This substance, for which the author proposes the name of *calcitrapic acid*, is obtained in the following manner:—The coarse powder of the entire plant, collected during the time of flowering, is exhausted with alcohol in a displacement apparatus, and the fluid thus obtained is agitated with a sufficient quantity of purified animal charcoal to remove the green color. The fluid is then filtered, and eight-tenths of the alcohol distilled from it. On cooling, oily drops are formed on the surface of the fluid. It is then evaporated on the vapor-bath, when new drops are formed; these are gradually collected, and finally dissolved in ether. By the evaporation of the ethereal solution, the substance is obtained with the properties already described.—*London Chemical Gazette, from Archiv der Pharm.* 2nd series, lxxx. p. 186.

CHEMICAL EXAMINATION OF THE CUBEBA CLUSII OF MIQUEL;
THE BLACK PEPPER OF WESTERN AFRICA.

By JOHN STENHOUSE, LL.D., F.R.S.

A few months ago Frederick Desnaux, Esq., African merchant, kindly presented me with a quantity of these cubebs, imported, I believe, from Abbeocouta, in Western Africa.

As considerable doubt has long existed respecting the true nature of these African cubebs, most botanists regarding them as a peculiar species of cubebs, while others believe them to be a kind of pepper to which they have given the name *Piper caudatum*, or tail-pepper, I was induced to take up the subject in order to see if Chemistry could throw any light upon the matter.

The smell of these African cubebs is very similar to that of ordinary cubebs, but their taste approaches very closely that of common pepper.

The powdered cubebs were digested with wood-spirit, and the spirit drawn off by distillation. The residuum obtained in this way dissolved in alcohol, to which a strong solution of caustic potash was added. The addition of the potash lye precipitated a brown colored oil, which, on standing for some time, yielded crystals. The mother-liquor, when treated with a new quantity of potash-lye, furnished a second precipitate, from which crystals were also obtained.

The crystals, after being collected, were dried by being strongly

pressed between folds of blotting-paper, and were then repeatedly crystallized out of spirit of wine. The crystals purified in this way were of a considerable size, being about a quarter of an inch in length and nearly colorless. Their form was that of oblique, four-sided prisms, precisely similar to piperine. They are very soluble in hot spirit of wine, pretty soluble in ether, but insoluble in water. When distilled with caustic potash they yield a volatile base, which has the characteristic odor of piperidine.

The subjoined analysis of these crystals demonstrates that they are identical with piperine:—

- I. 0.2160 grms. gave 0.5690 grms. of CO_2 and 0.1285 HO.
- II. 0.2325 grms. gave 0.6105 grms. of CO_2 and 0.1405 HO.
- III. 0.5235 grms. burnt with soda-lime, gave 0.1755 platinum.

CALCULATED.	ANALYSIS.			
	Regnault.	Gerhardt.	Laurent.	Stenhouse.
C_{88} -- 71.58	71.04 -- 71.34	71.52	71.66	71.84 -- 71.61
H_{38} -- 6.67	6.72 -- 6.84	6.66	6.66	6.61 -- 6.71
N_2 -- 4.91	4.94 -- —	4.82	—	4.76 -- —
O_{12} -- 16.84				

It appears, therefore, that whatever may be the botanical characters of African cubebs their chemical properties indicate that they are really a species of pepper, containing as they do piperin and not cubebin, the non-nitrogenous crystallizable principle of the cubeb tribe, which possesses no basic properties.—*London Pharm. Jour. Feb. 1855.*

PROCESS FOR TINNING METALS.

By MM. ROSELEUR AND BOUCHER.

The authors tin metals by decomposing solutions of certain double salts of tin, especially the phosphate, pyrophosphate, borate and sulphite, by means of the galvanic current. A solution for this purpose is obtained by dissolving 3 kilogrms. of pyrophosphate of potash and 500 grms. of protochloride of tin, in 200 litres of water. The temperature is raised to about 186°F. ,

and the bath may be kept saturated with tin by means of anodes of tin, by the action of the galvanic current. If it be observed that the bath does not deposit sufficient metal, a certain quantity of chloride of tin may be added to it; this at first forms a white precipitate, which, however, is again dissolved. A bath of this description, which had been constantly employed for a fortnight in tinning, required no addition of pyrophosphate, so that it might be expected that nothing of the kind would be necessary even for a much longer time. This process appears to be the only one proper for protecting zinc employed in roofing, in sugar moulds and kitchen utensils, from oxidation.

Cast iron tinned in this manner exhibits a fine silver-like appearance. The fluid for this purpose is prepared with—

Distilled water or rain-water	500 litres
Pyrophosphate of soda	6 kilogrms.
Commercial tin-salt	1
Dried and fused tin-salt	1½

According to the strength of the alkaline reaction of pyrophosphate of soda, which is not always of the same composition, the quantities of the fused and acid tin-salt must be varied. The bath must be kept at a temperature of 168°–186° F. The authors consider this composition to be the best, as its slight alkalinity precludes the disadvantage attending the use of an acid bath, which is favorable to oxidation, whilst it does not, like the strongly alkaline baths, deposit the tin of a bluish color, nor require much washing to get rid of its taste.

At first the authors employed a separate galvanic battery, but it appears that this is only necessary in coating zinc with tin. For other metals it is sufficient to immerse these, previously well cleaned, in the bath, together with some pieces of zinc, when they will be covered with a dull coating of tin in the course of two or three hours. This may be polished with a wire-brush. If the coating of tin is required to be thick, the objects must be immersed several times. The bath may be used almost constantly; it is sufficient, before introducing new objects, to add 300 grms. of pyrophosphate of soda and the same quantity of the tin-salt. The pieces of zinc are gradually dissolved.

The bath employed in tinning zinc has the following composition :—

Distilled water or rain-water	600 litres.
Pyrophosphate of soda	5 kilogrms.
Dried and fused tin-salt	1 kilogrm.

Chemical Gazette, from Le Technologiste, 1854, p. 629.

ON THE COMPOUNDS OF ARSENIOUS ACID WITH IODIDE OF POTASSIUM.

By E. HARMS.

Emmet has stated that a solution of arsenite of potash, mixed with sufficient acetic acid to prevent reddening of turmeric-paper, gives rise to a pulverulent precipitate of the composition $KI, 3AsO^3$, on the addition of iodide of potassium. The author has tested this statement, and found that this salt contains water, which is not dispelled at $302^\circ F$. The quantity of potassium found amounted to 8.21.

In these experiments the author has also discovered two other salts of the same kind. One of these is produced when arsenite of potash is employed without neutralization by acetic acid, the precipitate formed on the addition of iodide of potassium dissolved in boiling water, the solution mixed with 3 or 4 vols. of hot alcohol, and then treated with carbonic acid gas until a film of salt begins to be formed upon the sides of the vessel, and upon the tube through which the gas is passed. A syrupous fluid separates, containing much carbonic acid with iodine and arsenious acid. If the alcoholic solution be then further evaporated, a finely crystalline compound is obtained, with the composition $KI+3(KO\ HO, AsO^3)$. Its analysis gave,—

KI	.	.	26.06	25.98	1	26.32
AsO ³	.	.	46.91	46.87	3	47.01
KO	.	.	21.35	21.15	3	22.39
HO	.	..	5.43	4.67	3	4.28

The 3 equivs. of water are not driven off at $212^\circ F$., and even at $526^\circ F$. the water was not expelled.

The salt is readily soluble in water and alcohol. The hot saturated solution deposits the following salt on cooling, in wart-like masses, in which no appearance of crystallization can be detected even under the microscope.

With the salts of the alkaline earths, earths and metallic oxides,

this compound behaves generally like a mixture of iodide of potassium and arsenite of potash. Concentrated sulphuric acid throws down a red or yellowish-red precipitate of iodide of arsenic. Dilute sulphuric acid, and all other acids, decompose the compound. If a current of carbonic acid be passed through the hot saturated solution, a white pulverulent salt separates, the analysis of which led to the formula $KI, HO+3AsO^3$:—

	Found.		Calculated.
	31.61	31.51	32.08
KI . . .	57.67	57.43	57.17
AsO ³ . . .	8.43	..	9.07
KO . . .	..	..	1.73
HO . . .	..	..	..

This salt has an alkaline reaction, and when heated evolves an abundance of arsenious acid with aqueous vapor and arsenic.—*Chemical Gazette*, from Liebig's *Annalen*. p. 375.

ON THE FAT OF MYRISTICA OTOBA.

BY E. URICOECHEA.

The author has investigated the fat obtained by pressing the fruit of the *Myristica Otoba*. The fruits have the same taste as the nutmeg. It is employed in New Grenada, principally as an application in skin diseases of horses.

The fat, which is called *Otoba* in New Grenada, is not quite colorless; it is butyraceous, and when fresh smells like nutmeg. When fusing, it evolves a peculiar unpleasant odor. The fat melts at 100° F., whilst the fat of the common nutmeg melts at 124° F. Alcohol extracts from it a fat identical with that of the common nutmeg, with a melting point of 115° F. On saponification it furnished glycerine. The soap was dissolved in alcohol, and partially precipitated, according to Heintz's method, with acetate of magnesia; the separate precipitates were then decomposed by muriatic acid, the fatty acids washed with water, and purified by recrystallization from alcohol. The acid of the first precipitate melted at 94°.5 F., that of the second and third at 95°.4 F. They were consequently identical with myristic acid, the melting point of which, according to Heintz, is 96°.8 F. (94° Playfair). The analysis also agrees with the formula $C^{28}H^{20}O^4$.

When the precipitate of myristate of magnesia has been decomposed, and the myristic acid dissolved by alcohol, a residue is left. This is a new body, to which the author gives the name of *Otobite*. After it was purified by recrystallization from hot alcohol and ether, its composition was $D^{24}H^{13}O^5$. It is inodorous and tasteless, insoluble in water, and crystallizes in good-sized shining prisms. It fuses at $271^{\circ}.4$ F., and solidifies again in a crystalline form. When heated beyond this point it solidifies in an amorphous form. Heated on platinum foil, it evolves aromatic fumes, and then burns with a smoky flame. Its analysis gave:—

Carbon	73.19	72.85	24	73.09
Hydrogen	7.35	6.46	13	6.59
Oxygen	20.46	20.68	5	20.30

London Chem. Gaz., Feb. 1, 1855, from Liebig's Annalen.

REACTION FOR CAFFEINE.

By Prof. W. DELFFS.

If a solution of iodide of potassium and mercury, (obtained by saturating iodide of potassium with red oxide of mercury) be added to a solution of caffeine, a precipitate is produced, which in a short time forms an aggregation of shining, white, acicular crystals. The other alkaloids—cinchonine, cinchonidine, quinine, paricine, strychnine, leucine, morphine, codeine, papaverine, narcotine, delphinine, emetine, veratrine, atropine, bebeerine, aconitine, solanine, oxyacanthine, piperine, nicotine, and coniine, —also furnish precipitates with this reagent, even when diluted 60,000 times, but these remain amorphous.—*Chem. Gaz, Feb. 15, 1855, from Neues Jahrb. für Pharm.*

Varieties.

On Perfumery. By SEPTIMUS PIESSE.

(Continued from page 181.)

We have previously spoken of the difference in the odor between the English and French spirit; the marked distinction of British and Parisian perfumes made according to the same recipes is entirely due to the different spirits employed. Owing to the strong "bouquet," as the French say, of their spirit in comparison with ours, the continental perfumers claim a priority in the quality of their perfumes. Now, although we candidly admit that *some* odors are better when prepared with grape-spirit than with that from corn, yet there are others which are undoubtedly the best when prepared with spirit derived from the latter source. Musk, ambergris, civet, violet, tubereuse, and jasmin, if we require to retain their true aroma when in solution in alcohol, must be made with the British spirit.

All the citrine odors, verveine, vulnary waters, eau de Cologne, eau de Portugal, and eau d'Arquebuzade, Lavander, can alone be brought to perfection by using the French spirit in their manufacture. If extract of jessamine, or extract of violet, &c., be made with the French or brandy spirit, the true characteristic odor of the flower is lost to the olfactory nerve—so completely does the cenanthis ether of the grape spirit hide the flowery aroma of the otto of violet in solution with it. This solves the paradox that English extract of violet and its compounds, "spring flowers," &c., is at all times in demand on the continent, although the very flowers with which we make it are grown there.

On the contrary, if an English perfumer attempts to make eau de Portugal, &c., to bear any comparison as a fine odor to that made by Lubin of Paris, without using grape spirit, his attempt will prove a failure. True, he makes eau de Portugal even with English corn spirit, but judges of the article—and they alone can stamp its merit—discover instantly the same difference as the connoisseur finds out, between "Patent British" and foreign Brandy.

Perhaps it may not be out of place here to observe that what is sold in this country as British brandy is in truth grape spirit, that is, foreign brandy very largely diluted with English spirit! By this scheme, a real semblance to the foreign brandy flavor is maintained; the difference in duty upon English and foreign spirit enables the makers of the "capsuled" article to undersell those who vend the unsophisticated Cognac.

Some chemists, who, not being very deep in the "tricks of trade," have

thought that some flavoring, or that cœnanthic ether, was used to impart to British spirit the Cognac aroma. An article is even in the market called "Essence of Cognac," but which is nothing more than very badly made butyric ether.

On the continent a great deal of spirit is procured by the fermentation of the molasses from beet-root; this, of course, finds its way into the market, and is often mixed with the grape spirit; so, also, in England we have spirit from potatoes which is mixed in the corn spirit. These adulterations, if we may so term it, modify the relative odors of the primitive alcohols.

To complete this branch of the art of perfumery, we subjoin a few more recipes of the most popular bouquets; always considering that the standard reputation is gained for any particular odor, a host of imitations are thrust upon the market; these we disregard, although in some instances the imitations are superior to the original. The forms we give are according to the original text.

The recipes have been arranged alphabetically. As in the last number of the "Annals" we gave "Jockey Club," we now pass on to the

Kew Garden NOSEGAY.

Esprit de neroli (<i>Petale</i>)	- - - -	1 pint	Esprit de geranium	- - - -	1 pint
" cassie	} from } of each 1 pt.	pomade	" musk	} : -	of each, 3 oz.
" tubereuse			" ambergris		
" jasmin					

EAU DE MILLEFLEURS.

Esprit de rose, triple	- - - -	1 pint	Esprit de vanilla	} - - -	of each 2 oz.
" rose	} pomade	from } of each 1 pt.	" ambergris		
" tubereuse			" musk		
" jasmin			Otto of almonds	} - -	of each 10 drops.
" fleur d'orange			" neroli		
" cassie			" cloves		
" violette	} from }	}	" bergamot	- - - -	1 oz.
" rezeda, mignonette					

These ingredients are to remain together for at least a fortnight, then filtered prior to sale.

MILLEFLEURS ET LAVENDER.

Esprit de lavender (<i>Mitcham</i>)	- - - -	1 pint	Spirits from grape	- - - -	1 pint.
Eau des millefleurs	- - - -	1 pint.	French otto of lavender	- - - -	1 oz.
			Extract of ambergris	- - - -	2 oz.

DELICROIX'S MILLEFLEUR LAVENDER.

The original "lavender aux millefleur" is that of Delcroix, its peculiar odor is due to the French otto of lavender, which, although some folks like it, is very inferior to the English otto of lavender; hence the formula first given is far superior to that by the inventor, and has almost superseded the original preparations.

There are several other compounds or bouquets of which lavender is the leading ingredient, and from which they take their name, such as lavender and ambergris, lavender and musk, lavender and maréchale, &c., all of which are composed of fine spirituous essences of lavender, with about 15 per cent. of any of the ether ingredients.

BOUQUET DU MARÉCHALE.		NEPTUNE, OR NAVAL NOSEGAY.	
Esprit de rose, triple	} of each 1 pint.	Extrait de rose triple	} of each - 1 pint.
Extrait de fleur d'orange		" santal	
Extrait de vitivert	} - - - - - 1 pint.	" vitivert	
" vanilla		" patchouly	
" orris		" verbena - - - - - 1 pint.	
" tonquin		BOUQUET OF ALL NATIONS.	
Esprit de neroli	} - of each 1 pint.	Nations wherein the odors are produced.	
Extrait of musk		TURKEY - - -	Esprit de rose, triple 1 pint.
" ambergris		AFRICA - - -	Extrait of jassin 1 pint.
Otto of cloves	} - - of each 1 drachm.	ENGLAND - - -	" lavender 1 pint.
" santal		FRANCE - - -	" tubereuse 1 pint.
EAU DE MOUSSELAINE.		SOUTH AMERICA	" vanilla 1 pint.
Bouquet maréchale	- - - - - 1 pint.	TIMOR - - -	" santal - 1 pint.
Extrait de cassie	} from } of each 1 pt.	ITALY - - -	" violet - 1 pint.
" jassin		HINDOOSTAN	" patchouly 1 pint.
" tubereuse		CEYLON - - -	Otto of citronella 1 drachm.
" rose		SARINIA - - -	" lemons - - 1 oz.
Otto of sandal	- - - - - 2 drachms.	TUNQUIN - - -	Extrait of musk 1 pint.
BOUQUET DE MONTPELLIER.		ROYAL OSBORNE BOUQUET.	
Extrait de tubereuse	- - - - - 1 pint.	Extrait of orris	- - - - - 1 pint.
" rose de pomade	- - - - - 1 pint.	" vitivert	- - - - - 1 pint.
" rose triple	- - - - - 1 pint.	" santal	- - - - - 1 pint.
Extrait of musk	} - of each 1 pint.	" rose	- - - - - 1 pint.
" ambergris		BOUQUET DU ROI.	
Otto of cloves	- - - - - 1 1/2 drachm.	Extrait of jassin	} from } of each 1 pint.
" bergamot	- - - - - 1 oz.	" violet	
CAPRICE DE LA MODE.		" rose	} pomade } of each 1 pint.
Extrait de jassin	} of each 1 pint.	" vanilla	
" tubereuse		" musk	} of each - 1 oz.
" cassie		" ambergris	
" fleur d'orange		Otto of bergamot	- - - - - 1 oz.
Otto of almonds	- - - - - 10 drops	" cloves	- - - - - 1 drachm
" nutmegs	- - - - - 10 drops.	BOUQUET DE LA REINE.	
Extrait of civet	- - - - - 1/2 pint.	Esprit de rose	} from } of each 1 pint.
MAY FLOWERS.		Extrait de violette	
Extrait of rose (de pomade)	} of each 1 pt.	" tubereuse	- - - - - 1 pint.
" jassin		" fleur d'orange	- - - - - 1 pint.
" fleur d'orange		Otto of bergamot	- - - - - 1/2 oz.
" cassie	} - - - - - 1 pint		
" vanilla			
Otto of almonds	- - - - - 1/2 drachm		

RONDELETIA.

The perfume bearing the above name is undoubtedly one of the most gratifying to the smelling nerve that has ever been made. Its inventors, Messrs. Hannay and Dietrichen, have probably taken the name of this odor from the *Rondeletia*, the *Chyn-len* of the Chinese; but the plant, as far as we can learn, yields no aroma. We have before observed that there is a similarity of effect upon the olfactory nerve produced by certain odors, although derived from totally different sources. That, for an instance, otto of almonds may be mixed with extract of violet, in such proportion that, although the odor is increased, yet the character peculiar to the violet is not destroyed. Again: there are certain odors which, on being mixed in due proportion, produce a new aroma, perfectly distinct and characteristic to itself. This effect is exemplified by comparison with the influence of certain colors when mixed upon the nerve of vision, such, for instance, as when yellow and blue are mixed, the result we call green; or when blue and red are united the compound color is known as puce or violet.

Now when the odor of lavender and odor of cloves are mixed they produce

a new fragrance, i. e., *Rondeletia*! It is such combinations that constitute in reality "a new perfume," which, though often advertised, is very rarely attained. *Jasmin* and *patchouly* produce a novel aroma, and many others in like manner, proportion, and strength, when so mixed, must of course be studied, and the substances used accordingly. If the same quantity of any given otto be dissolved in a like proportion of spirit, and the solution be mixed in equal proportions, the strongest odor is instantly indicated by covering or hiding the presence of the other. In this way we discover that *patchouly*, *lavender*, *neroly*, *verbena*, are the most potent of the vegetable odors, and that *violet*, *tubereuse*, and *jasmin*, are the most delicate.

Many persons will at first consider that we are asking too much, when we express a desire to have the same deference paid to the olfactory nerve, which the other nerves that influence our physical pleasures and pains so constantly receive with homage. By tutoring the olfactory nerve, it is capable of perceiving matter in the atmosphere of the most subtle nature. Not only that which is pleasant, but also such as are unhealthful. If an unpleasant odor is a warning to seek a cleaner atmosphere, surely it is worth while to cultivate that power which enables us to act up to that warning for the general benefit of health.

To return, however, to *rondeletia*, it will be seen by the annexed formulæ, that, besides the main ingredients to which it owes its peculiar character—that is, *cloves* and *lavender*—it contains *musk*, *vanilla*, &c. These substances are used in these as in nearly all other bouquets for the sole purpose of fixing the more volatile odors to the handkerchief.

ESSENCE OF RONDELETIA.

Spirit (brandy 60 o. p.)	-	-	1 gallon.	Otto of bergamot	-	-	1 oz.
Otto of lavender	-	-	2 oz.	Extract of musk	-	-	
" cloves	-	-	1 oz.	" vanilla	-	-	
" rose	-	-	3 drachms.	" ambergria	-	-	
						of each	½ pint.

The mixture must be made at least a month before it is fit for sale. Very excellent *rondeletia* may also be made with English spirit.

BOUQUET ROYALE.

Extract of rose (from pomade)	-	1 pint.	Otto of lemons	-	-	½ oz.
Esprit de rose, triple	-	½ pint.	" bergamot	-	-	
Extract of jasmin } from }	each	½ pint	Extract of musk	-	-	
" violet } pomade }			" ambergria	-	-	
*Extract of verbena }	each	2½ oz				1 oz.
" cassie }						

SUAVE.

Extract of tubereuse	-	-	Extract of musk	-	-	2 oz.
" jasmin	-	-	" ambergria	-	-	
" cassie	-	-	Otto of bergamot	-	-	½ oz.
" rose	-	-	" cloves	-	-	1 drachm.
" vanilla	-	-				
		5 oz.				

SPRING FLOWERS.

Extract of rose } from }	each	1 pint.	Extract of cassie	-	-	2½ oz.
" violet } pomade }			Otto of bergamot	-	-	2 drachms.
" rose, triple	-	2½ oz.	Extract of ambergria	-	-	1 oz.

* EXTRACT invariably means the solution of the odorous principle in alcohol.

The just reputation of this perfume places it among the first rank of the very best mixtures which have ever been made by any manufacturing perfumer. Its odor is truly flowery, but peculiar to itself. Being unlike any other aroma it cannot well be imitated, chiefly because there is nothing that we are acquainted with that at all resembles the odor of the esprit de rose, as derived from macerating rose pomade in spirit, to which, and to the extract of violet, nicely counterpoised, so that neither odor predominates, the peculiar character of "Spring Flowers" is due; the little ambergris that is present gives permanence to the odor upon the handkerchief, although from the very nature of the ingredients it may be said to be a fleeting odor. "Spring Flowers" is an Englishman's invention, but there is scarcely a perfumer in Europe that does not attempt an imitation.

TULIP NOSEGAY.

Nearly all the tulip tribe, although beautiful to the eye, are inodorous. The variety called the Duc Van Thol, however, yields an exquisite perfume, but it is not used by the manufacturer for the purpose of extracting its odor. He, however, borrows its poetical name, and makes an excellent imitation thus:—

Extract of tuberose	} from	1 pint.	Extract of orris	-	-	-	3 oz.
" violet		1 pint.	Otto of almonds	-	-	-	3 drops.
" rose		½ pint.					

VIOLETTE DU BOIS.

Under the head Violet, we have already explained the method of preparing the extract or essence of that modest flower. The Parisian perfumers sell a mixture of violet, which is very beautiful, under the title of the *Violette du Bois*, or, the Wood Violet, which is made thus:—

Extract of violet	-	-	-	1 pint.	Extract of rose (from pomade)	-	-	-	3 oz.
" orris	-	-	-	3 oz.	Otto of almonds	-	-	-	3 drops.
" cassie	-	-	-	3 oz.					

This mixture, in a general way, gives more satisfaction to the customer than the pure violet.

WINDSOR CASTLE BOUQUET.

Alcohol	-	-	-	-	1 pint.	Extract of orris	-	-	-	1 pint.
Otto of neroly	} each	-	-	-	½ oz.	" jasmin	} each	-	-	½ pint.
" rose		-	-	-		" cassie		-	-	
" lavender		-	-	-		" mock	} each	-	-	2½ oz.
" bergamot,		-	-	-	8 drops.	" ambergris		-	-	
" cloves	-	-	-	-						

YACHT CLUB BOUQUET.

Extract of santal	-	-	-	-	1 pint.	Extract of vanilla	-	-	-	½ pint.
" neroly	-	-	-	-	1 pint.	Flowers of benzoin	-	-	-	½ pint.
" jasmin	} each	-	-	-	½ pint.					
" rose, triple		-	-	-						

We have now completed the branch of the art of perfumery which relates to handkerchief perfumes, or wet perfumery. Although we have rather too much encroached upon the space of "The Annals" in giving the composition of so many bouquets, yet there are many left unnoticed which are

popular. Those that are given are noted more particularly for the peculiar character of their odor, and are selected from more than a thousand recipes that have been practically tried.

Those readers who require to know any thing about the simple extracts of flowers are referred to them under their respective alphabetical titles.—*Annals of Pharmacy.*

Electro-Magnetic Engraving Machine.—This machine is somewhat on the principle of the well known planing machine. The drawing to be copied and the plate to be engraved are placed side by side, on the moveable table or lid of the machine; a pointer or feeler is so connected, by means of a horizontal bar, with a graver, that when the bar is moved, the drawing to be copied passes under the feeler, and the plate to be engraved passes, in a corresponding manner under the graver. It is obvious that, in this condition of things, a continuous line would be cut on the plate; and, a lateral motion being given to the bed, a series of such lines would be cut parallel to and touching each other, the feeler of course passing in a corresponding manner over the drawing. If then, a means could be devised for causing the graver to act only when the point of the feeler passed over a portion of the drawing, it is clear we should get a plate engraved, line for line, with the object to be copied. This is accomplished by placing the graver under the control of two electro-magnets, the one to draw the graver down to the plate, the other to press it down on it. The coil enveloping one of these magnets is in connection with the feeler, which is made of metal. The drawing is made on a metallic or conducting surface, with a rosined ink, or some other non-conducting substance. An electric current is then established, so that when the feeler rests on the metallic surface, it passes through the coils of the magnet, and causes it to lift the graver from the plate to be engraved. As soon as the feeler reaches the drawing and passes over the non-conducting ink, the current of electricity is broken, and the magnet ceases to act, and by a self-acting mechanical arrangement the current is at the same time diverted through the coils of the second magnet, which then acts powerfully and presses the graver down. This operation being repeated until the feeler has passed in parallel lines over the whole of the drawing, a plate is obtained, engraved to a uniform depth, with a fac simile of the drawing. From this a type-metal cast is taken, which, being a reverse in all respects of the engraved plate, is at once fitted for use as a block for surface printing. The machine is the invention of Mr. William Hansen, of Gotha.—*Jour. of the Franklin Institute, from the Jour. of the Soc. of Arts.*

Minutes of the College.

The Annual Meeting of the Philadelphia College of Pharmacy was held 3d mo. 26th, 1855, at the College Hall. In the absence of the President, Dillwyn Parrish, second Vice President, presided.

The minutes of the last meeting of the College were read and accepted.

The minutes of the Trustees for the last six months being called for, were read by Alfred B. Taylor, their Secretary.

The minutes of the Board informed that they have had a new seal cut according to the instructions of the College, and have thrown aside the seal formerly used on the diplomas. A suitable seal press has also been purchased.

Benjamin J. Crew, James L. Bispham, John C. Savery, Henry N. Rittenhouse, Samuel S. Bunting, and Samuel S. Garrigues have been elected to membership since the last meeting of the College.

The Degree of Graduate in Pharmacy has been conferred upon twenty-six students of the last session of the School of Pharmacy.

The Committee appointed at last meeting to distribute through Pennsylvania, New Jersey, and Delaware the "Proceedings" and "Address" of the American Pharmaceutical Association, reported the result of their labors in detail. On motion, their report was accepted, and the list of names reported by the Committee was directed to be furnished to the Executive Committee of the Association for future use.

The Annual Report of the Committee on Sinking Fund showed a nett revenue from the several sources available for that fund, which, during the past year, has enabled the Committee to extinguish six shares of the College loan, reducing the debt of the College to \$400.

The College building being much in need of repair, the Committee proposed the following resolution, which was adopted :

Resolved, That the Committee on Sinking Fund be authorized to loan the Treasurer of the College, on interest, the amount in their hands, or such amount as may be required to put the College building in better condition for renting.

The Report of the Committee on Latin Labels showed that the edition of bronzed labels published previous to the last report, is nearly exhausted, and proposed the issue of a new edition with the funds now in their hands.

Of the last edition of yellow labels, 525 copies remain unsold. On motion of T. S. Weigand, the Committee was authorized to proceed with the publication as proposed.

The following Report of the Publication Committee was read and accepted :

To the Philadelphia College of Pharmacy.

The Publishing Committee respectfully report, that during the past year, the Journal has been regularly issued, extending to the second number of the 27th volume inclusive. The change in the size of the work appears to give continued satisfaction. The number of new subscribers since last report is forty-three. The contributions of original articles, although much fewer than the large number of pharmacists able to furnish them justifies a reasonable expectation of, are on the increase, both in number and variety, as well as from more distant localities, and lead us to be encouraged that at no distant day many of the subscribers and others will feel a pride in upholding the Scientific department of their profession, by recording the observations they may make in the course of business, as well as by pursuing regular investigations.

Through the agency of the Exchange Department of the Smithsonian Institution we have succeeded in bringing our Journal to the notice of the Society of Pharmacy at Paris, who now send their Journal in exchange. Through the same medium the Journal has been forwarded to the Apothecaries' Associations of Northern and Southern Germany, and its reception has been duly acknowledged. Several numbers were also sent to the Pharmaceutical Association of Stockholm, but as yet no acknowledgement of their reception has been received by the Committee.

As the circulation of the American Journal of Pharmacy in Europe may be the means of exciting an interest in the state of Pharmacy in the United States, and thereby enable us to exchange journals and specimens advantageously, the Committee believe that good results would accrue both to the College and its Journal, by sending a copy of the latter to every foreign *honorary member*, and to such editors of scientific journals as will be likely to exchange.

The subject of the gratuitous furnishing of the Journal to contributing and life members, referred to this Committee at the meeting in September, has received its earnest attention. After a careful comparison of the receipts and expenditures of the past year, they find, that aside from the sum of \$470, (which was the balance in the treasury of the Committee at the termination of the last fiscal year,) the expenditures equal the receipts within *eighteen* dollars, notwithstanding that several extraordinary items are among the latter, arising in part from the sale of several sets of the back volumes. Consequently the regular receipts have not equalled the expenses. In view of this they are not prepared to recommend the adoption of the Resolution of Prof. Thomas, but propose the following measure in lieu of it, viz:

Resolved, That the annual contribution of the members of the College be reduced to *three* dollars; that the Journal be furnished to contributing members at *two* dollars per volume, leaving it optional with them to take it or not; and that it be sent to the life members free of charge.

The Committee believe that this arrangement will meet the wishes of members, that it will relieve the journal from any embarrassment, and at any time in the future that it may be found expedient the available excess of the journal funds can be appropriated by the College as they may be needed, just as is now done annually to the sinking fund.

CHARLES ELLIS,
WILLIAM PROCTER, JR.
A. B. TAYLOR,
EDW. PARRISH,
ROBT. BRIDGES,

Publishing Committee.

Annexed to this report was a statement of the finances of the Committee, showing receipts from subscriptions, sale of Journals, &c., \$1479 23 against expenses of editing, printing, and delivering Journal, including \$50 paid the Sinking Fund Committee, \$1460 61. Balance now in hands of Committee \$488 83.

The resolution introduced by the Committee as above, being now fully discussed, as also that of Dr. Thomas offered at the last meeting, on motion the latter was amended so as to read,

Resolved, That all the life members and contributing members not in arrears to the College be furnished with the American Journal of Pharmacy free of charge. This was finally adopted by a small majority of the members present.

On motion of Samuel F. Troth, it was unanimously

Resolved, That the Annual Appropriation of \$50 from the Publication Committee to the Sinking Fund be hereafter released.

A communication was received and read, signed by Joseph Trimble, Jr., resigning his membership in the College. On motion it was accepted on the condition prescribed by our rules.

The annual election was now held, Evan T. Ellis and J. C. Savery acting as Tellers. It resulted as follows:

After the balloting had concluded, the Tellers announced the following as the results, viz.:

OFFICERS OF THE COLLEGE.

For President	Charles Ellis,
First Vice President	Samuel F. Troth, *
Second Vice President	Dillwyn Parrish,
Recording Secretary	Edward Parrish,
Corresponding Secretary	William Procter, Jr.
Treasurer	Ambrose Smith.

Eight Trustees to fill the vacancies occurring at this time.

John H. Eeky,	Wm. P. Troth,
J. C. Turnpenny,	Prof. R. Bridges,
Daniel S. Jones,	Samuel N. James,
T. S. Weigand,	John C. Savery.

Committee on Sinking Fund:

S. F. Troth,	Ambrose Smith,	E. Parrish.
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Publication Committee.

Charles Ellis,	William Procter, Jr.,
Robert Bridges,	Alfred B. Taylor,
	Edward Parrish.

Delegates to American Pharmaceutical Association.

Wm. Procter, Jr.,	H. C. Blair,
Charles Ellis,	Edward Parrish,

Alfred B. Taylor.

Then on motion adjourned.

EDWARD PARRISH, *Secretary*

Philadelphia College of Pharmacy.

COMMENCEMENT—1855.

The Annual Commencement of the Philadelphia College of Pharmacy was held on Thursday evening, March 22d, at 8 o'clock, in the Musical Fund Hall, in the presence of a large and respectable audience.

The Degree of Graduate in Pharmacy was conferred on behalf of the Board of Trustees, by its Presiding Officer, HENRY C. BLAIR, Esq., on the following gentlemen :

<i>Graduates.</i>	<i>Subject of Thesis.</i>
JAMES A. ARMSTRONG, . . . Pa. . . .	*Anthemis Cotula.
WILLIAM C. BAKES, . . . " . . .	Spiræa Tomentosa.
JOSEPH W. BANCROFT, . . . " . . .	Prinos Verticillatus.
CHARLES A. BANNVART, . . Paris, . . .	Asclepias Incarnata.
WILLIAM H. BASSETT, . . Del. . . .	Fluid Ext'ts and their preparation.
AUGUSTUS D. CARROLL, . . Va. . . .	Cimicifuga Racemosa.
JACOB DUNTON, Pa. . . .	Action Schuy'l Water on Lead Pipe.
CHARLES W. EPTING, . . . " . . .	Caulophyllum Thalictroides.
ROBERT FAIRTHORNE, . . England. . . .	Active Principles of the Hop.
J. CLARKSON GRIFFITH, . . Va. . . .	Menispermum Virginicum.
JAMES P. HOFFECKER, . . . Del. . . .	Eupatorium Perfoliatum.
M. HENRY KOLLOCK, . . . N.J. . . .	Gelseminum Sempervirens.
THOMAS LANCASTER, London, Eng. . . .	Syrup of Nitrate of Iron.
EDMUND D. LAWALL, . . . Pa. . . .	Bitter Principle of Gentian.
JAMES C. LEAMY, . . . Calif. . . .	Iris Versicolor.
HERMANN LEUCHSENREING, Paris. . . .	Phellandrium Aquaticum.
GEORGE W. McFEE, . . . Pa. . . .	Euphorbia Ipecacuanha.
HENRY MITTNACHT, . . . Md. . . .	Cocculus Palmatus.
DAVID U. MORGAN, . . . Pa. . . .	Lead and its Compounds.
CHARLES W. PEDRICK, . . . Va. . . .	Asclepias Tuberosa.
ELLISTON L. PEROT, . . . Pa. . . .	Cassia Marilandica.
HENRY N. RITTENHOUSE, . . " . . .	Barosma Crenata.
ALONZO ROBBINZ, " . . .	Optical properties of Fecula.
JOHN H. RUCH, " . . .	Gillenia Trifoliata.
WILLIAM T. WENZEL, . . . Mo. . . .	Corydalis Formosa.
JOSEPH E. YOUNG, Pa. . . .	Cicuta Maculata.

After the ceremony, the Valedictory Address was delivered by Prof. WILLIAM PROCTER, Jr.

By Order of Board of Trustees,

ALFRED B. TAYLOR, Secretary.

*NOTICE.***TO THE PHARMACEUTISTS AND DRUGGISTS OF THE UNITED STATES.****AMERICAN PHARMACEUTICAL ASSOCIATION.**

The 3d Section First Article of the Constitution requires the President, at least three months previous to the annual meeting, to publish a call, in all the Pharmaceutical and in such other Medical Journals as he may select, stating therein the objects of the Association and the conditions of the Membership. In compliance with this duty, you are hereby notified, that the next annual meeting of the Association will be held in the City of New York, on the second Tuesday, (11th) of September, 1855, at 3 o'clock P. M.

The objects of the Association are, to deliberate on the condition of our profession, the advancement of Pharmaceutical knowledge, and the elevation of the professional character of Apothecaries and Druggists throughout the United States.

CONDITION OF MEMBERSHIP.

Section II—ARTICLE I. All pharmacutists and druggists who shall have attained the age of twenty-one years, whose character, morally and professionally, is fair, and who, after duly considering the obligations of the Constitution and Code of Ethics of this Association are willing to subscribe to them, shall be eligible for membership.

ARTICLE II. The members shall consist of delegates from regularly constituted Colleges of Pharmacy, and Pharmaceutical Societies, who shall present properly authorized credentials, and of other reputable Pharmacutists feeling an interest in the objects of the Association, who may not be so delegated, the latter being required to present a certificate signed by a majority of the delegates from the places whence they come. If no such delegates are present at the Association, they may on obtaining the certificates of any three members of the Association be admitted, provided they be introduced by the committee on credentials.*

ARTICLE IV. Every member shall pay into the hands of the Treasurer the sum of two dollars as his yearly contribution.

ARTICLE V. Every local Pharmaceutical Association shall be entitled to five delegates.

W. B. CHAPMAN, President.

Cincinnati, April 11, 1855.

[* *Note by the Editor.*—The wording of the second article of the constitution has been understood by many in an exclusive sense. It should be distinctly understood that all reputable Pharmacutists and druggists, who are favorable to the objects of the Association will be welcomed at the meeting.]

Editorial Department.

UNIVERSAL EXHIBITION OF 1855, AT PARIS.—Through the politeness of Dr. Alfred L. Kennedy, Chairman of the Pennsylvania Commission to the Paris Exhibition, we have received a pamphlet of 78 pages, issued by the Imperial French Commissioners, which embraces a "system of classification" to serve as a basis for the arrangement of the products exhibited, and the rules which will be observed in grouping objects in the exhibition.

The whole exhibition will be classed in two divisions, viz: I. *Industrial Products*. II. *Works of Art*. The products of industry are arranged in seven groups, viz: 1st group. Those having for their principal object the production or extraction of raw materials, as mining, lumbering, fisheries, agriculture, and the breeding of animals. 2d group. Industry, having for its special object the use of mechanical forces. 3d group. Those specially based on the employment of physical and chemical agents, relating to the sciences and instruction. 4th group. Those which relate to the learned professions, including hygiene, pharmacy, the military art, etc. 5th group. Manufactures of mineral products, such as jewelry, bronzes, glass ware, porcelain, enamel, etc. 6th group. Manufactures of tissues, cotton, linen, silk and straw manufactures. 7th group. Furniture and decoration, in fashions, manufacturers' designs, printing, and musical instruments.

The second division constitutes the 8th group, under the title of "the fine arts," and includes painting, engraving, lithography, sculpture, medal engraving, and architecture.

Chemicals are placed in the 3d group, 10th class, 1st section, and are arranged under the following heads, viz:

1. Apparatus and general processes of making chemical products.
2. Manufactured products principally derived from mineral substances.
3. Manufactured products chiefly derived from vegetable substances.
4. Manufactured products mainly derived from animal substances.
5. Various chemical products, made or purified chiefly for the sciences.

Pharmaceuticals are placed in the 3d group, 12th class, and 4th section, and arranged under the following heads, viz:

1. Pharmaceutical processes in general.
2. Articles of the *materia medica* in their natural condition.
3. Simple medicines, fixed and volatile oils, powders, &c.
4. Compound medicines; tinctures, pills, syrups, etc.
5. Accessories, surgical dressings, leeches, etc.

The whole is very systematically arranged, and if the numerous classes and sections are duly represented, the exhibition will be very comprehensive. So far as we have heard, but little general effort is being made in the United States, and in chemistry and pharmacy less than an average of the other branches of industry.

EDITORS vs. POSTAGE.—For some years past we have frequently been applied to through the post-office for information on pharmaceutical, chemical, and other subjects, which inquiries we have cheerfully endeavored to answer to the extent of our ability. The new post-office law, requiring pre-payment for *all* letters, will make it necessary for us to pass unnoticed all communications strictly relating to the business or interest of the writers, unless their importance should cause us to waive the rule. We do this in justice to ourselves, as, already, we have been at considerable expense in this way from the thoughtlessness of some correspondents. We trust, therefore, in all cases where a correspondent expects an answer relative to his own business, that a stamp will be enclosed.

DOMESTIC MEDICINES.—Under this caption the editor of the New Jersey Medical Reporter presents the following, viz.:

"If mankind, in general convention assembled, were allowed to vote on the question of death, or no death, we have little doubt but the hour of dissolution would be "postponed indefinitely," by a majority that would laugh a veto to scorn. Yet there is no foregone conclusion so inevitable, as that the pathway of life, whether strewn with flowers or thorns, by a descent, sometimes gentle, sometimes abrupt, ends in an open grave. This doom, however philosophically met, is met by the larger part of mankind with great reluctance, and the drowning man who catches at a straw, is an apt illustration of the absurd and irrational attempts often made to prolong life. It is this innate dread of death that has called into being the profession of medicine, and the business of the apothecary. It is this also that has led mankind to torture nature in pursuit of that chimera, the elixir of life, and induced so many mercenary individuals to speculate in human distress and infirmity as ruthlessly as they would in the funds of the Stock Exchange, if they had the ability. With what success this is done, may be seen in the palates reared by quackery in most of our large cities.

It is astonishing to what an extent the uncertain and often deleterious preparations made by these men, are consumed by all classes of society; and there is no question but such a wholesale consumption of drugs, having no guarantee of their purity or innocuity but that of a single mercenary individual, is calculated to do untold injury to the health of the community. But there is a demand for domestic remedies which these preparations are intended to supply, and the question arises whether this demand can be supplied in a manner that will guard against the venality of using drugs of uncertain properties or deleterious qualities.

A considerable portion of the time of the American Medical Association is consumed every year in discussing plans for the suppression of quackery. This is certainly a consummation devoutly desired by all who have any regard for the welfare of the sick, and the only question is one of expediency.

We respectfully throw out the following suggestions on the subject, pre-

missing, that though often thought and spoken of by ourselves, they receive additional force from the action of a committee of the American Pharmaceutical Association, quoted on a subsequent page. [See vol. xxvi, page 393, *Amer. Jour. Pharm.*]

Let a committee be appointed by the American Medical Association, a part of whom should be pharmacutists, or better, perhaps, let the committee act in unison with one appointed by the American Pharmaceutical Association, whose duty it shall be to draw up a set of formulæ for remedies, calculated to meet the ordinary demands of domestic practice. These formulæ should be adopted by the American Medical and Pharmaceutical Associations, and published for the benefit of all concerned—not excepting the consumer, when he desires to know their ingredients—and they should be as uniformly adhered to as any of our common official preparations. The medicines should be put up in uniform style, and issued under the sanction of the American Medical and Pharmaceutical Associations. In this manner the popular demand for domestic remedies will be supplied with medicines whose action can be relied on, and which can be honestly recommended in ordinary cases, by the apothecary, and even by the general practitioner. No countenance should be given by the apothecary to any of the numerous quack preparations with which their shops are now gorged, and the physician who should soil his fingers with them, should, of course, lose caste immediately.

The apothecary would reap advantage from such an arrangement, as he would prepare the remedies from the crude drugs, and receive all the profits on them, instead of being obliged to divide them with another party, who receives the lion's share.

We believe that the plan suggested above, if properly carried out, would do more towards the suppression of quackery, than any legislative action that can be brought to bear upon it. There are so many who are largely interested in the support of quackery, who, with their sympathizers, would be so restive under any legal disabilities, that if laws were passed bearing upon that evil, their operation and stability would be uncertain, and their execution most likely unsatisfactory."

We like the tone of Dr. Butler's remarks, as they indicate a willingness to adopt a practicable remedy for a great and crying evil. If such a series of these formulæ could be agreed upon as would apply to those ordinary cases as are usually treated in families without calling in the physician, and for want of which they often resort to quackery, and which the apothecary could recommend with safety and propriety, they would go far to displace from use a large portion of the quackeries of the day—a certain class of nostrums, addressed to the marvellous, and promising miracles, perhaps excepted.

MASSACHUSETTS COLLEGE OF PHARMACY.—We extract the following from the *Boston Medical and Surgical Journal*, viz. —

"The annual meeting of this institution was held at the rooms in Phillips Place, on Monday, March 5th. The officers elected for the ensuing year are, Daniel Henchman, President; S. M. Colcord and J. T. Brown, Vice-Presidents; Thomas Hollis, Corresponding Secretary; Henry W. Lincoln, Secretary; T. Larkin Turner, Auditor. The Trustees elected were Henry D. Fowle, Charles H. Atwood, George W. Parmenter, Augustus P. Melzar, John Buck, James S. Melvin, Robert R. Kent, Albert G. Wilbur.

The doings of the Board of Trustees for the past year were read and ap-

proved, reports were received from the various committees, and other usual business of an annual meeting transacted. The new and beautiful certificate of membership was ready for distribution to the members, intended to be put in a conspicuous place in their dispensary stores as a guarantee of *professional qualification* to the medical profession and the public. The college have also published, the past year, a uniform scale of prices. Its affairs seem to be in a very prosperous condition; and, having the confidence of the medical profession, it bids fair to wield a powerful influence, increasing in usefulness and professional advancement. City physicians favorable to the college would do well to write their prescriptions upon paper furnished them by any of its members gratis, with the names of their dispensers printed upon it."

Elements of Chemical and Physical Geology. By GUSTAV BISCHOF, Ph. D., Prof. of Chemistry and Technology in the University of Bonn. Translated from the MS. of the author by BENJAMIN H. PAUL, F.C.S., and J. DRUMMOND, M.D. Vol. 1. London: 1854. Printed for the Cavendish Society.

This is the first of the three volumes which are to constitute the work in its English dress. When the Cavendish Society entertained the idea of publishing a translation of Bischof, they determined to consult the author, and, as his first volumes had been published several years, to get him to prepare the copy for an English edition, which should not exceed 1500 pages in extent—the German edition extending to 3300—which was accordingly done. The author remarks, "The present edition, indeed, is by no means a mere translation or abridgement of the German, but an independent work, in which the chemico-geological facts ascertained since the preparation of the latter have been taken up so far as space permitted." The earnest Neptunian opinions of the author are sustained by very numerous observations and arguments, and some of his developments in regard to the remarkable influences of gases in solution in water, and in the atmosphere, are exceedingly interesting, and have led him to many views as novel as they at first are startling, as in the following paragraphs:

"When all these facts are considered, we cannot but come to the conclusion that sulphur is in no case a primitive production, but, as far as regards its principal localities, has resulted from the decomposition of sulphuretted hydrogen."

"Like carbon, sulphur appears to owe its existence in a free state to the organic kingdom. Carbonic acid is decomposed by living plants; sulphates are decomposed by dead organic matter. In this instance, as in so many others, the important influence of the organic kingdom upon the inorganic is perceptible, and the existence of sulphur, prior to organic life, appears very doubtful."

Liebig and others have referred the origin of the diamond to organic matter, that chemist attributing it to a gradual isolation of the carbon by the removal of hydrogen and oxygen by a process of decay. Our author combats this view by showing that the only rock in which the diamond has been found *in situ*, is of far later date than the coal formations in which we would most likely be induced to look for them, and refers their formation rather to the

deoxidizing agency of organic matter in contact with sesquioxide of iron and sulphates, resulting in the isolation of the carbon, which *in statu nascenti* might be capable of crystallizing. The author remarks :

"The geologists who ascribe to the earth an igneous origin, can adopt no other view than that all the carbon upon or in the earth is of secondary origin, and therefore was not present at the period of creation; for the reducing agent of the iron ores would not have remained in contact with peroxide of iron and other oxides in the state of igneous fusion without being converted into carbonic acid and carbonic oxide gases, thus causing the reduction of the oxides. Since the entire group of unstratified crystalline rocks, which, according to the hypothesis of the Plutonists, have been ejected from beneath, contain in their masses no carbon, this fact must lead them to the conviction that this substance cannot possibly be of an original formation.

"The foregoing considerations show that even carbon in its purest form as the diamond, can only be regarded as a product of the decomposition of organic substances. So long, therefore, as carbon in the unoxidized state and bearing all the marks of not having resulted from decomposed organic substances, is not shown to be preserved in rock, we cannot regard this simple body as one which existed at the time of creation. Carbon like all the other simple bodies occurs very sparingly or not at all in the mineral kingdom; just as we find all the other simple bodies, with the exception of chlorine, bromine, iodine, and fluorine, chiefly in combination with oxygen, and such of them as form the chief constituents of rocks are only thus combined; so we find carbon also as a constituent of rocks, only in the oxidized conditions in carbonates; thus we find it also in the exhalations, in waters and in the atmosphere."

"All the carbon as yet known to occur in the isolated condition, can therefore only be regarded as a product of decomposition of carbonic acid, and it is the vegetable kingdom which yielded and still yields this product."

We hope at a future opportunity to bring forward some interesting extracts from this work, which our limited space at present precludes. The second volume will be one of the volumes for 1855, and may probably be expected about the close of the year.

What to observe at the bedside and after death in medical cases. Published under the authority of the London Medical Society of Observation. Second American, from the second and enlarged London Edition. Philadelphia: Blanchard and Lea. 1855.

It will not be expected that a book with the above title will receive a critical notice in a journal devoted to pharmacy, yet a glance over the pages of this volume will show, even to the unprofessional reader, that the habitual observance of its precepts by the physician, must very much conduce to the accuracy of medical observation, and to the increase of medical knowledge.

On Adipocire and its formation. By CHARLES M. WETHERILL, Ph. D., M.D. Extracted from the Transactions of the American Philosophical Society.

We are indebted to the author for a copy of this paper, but it arrived too late for notice in this number.

THE
AMERICAN JOURNAL OF PHARMACY.

JULY, 1855.

ON *CICUTA MACULATA*, OR WATER HEMLOCK.

By JOSEPH EVANS YOUNG.

(An Inaugural Essay presented to the Philadelphia College of Pharmacy.)



Flowering branch of *Cicuta maculata*.

BOTANICAL DESCRIPTION.—*Sex. Syst.* Pentandria digynia.
Nat. Ord. Apiaceæ or Umbelliferæ.

GEN. CH.—Partial involucre, leaves ternate and pinnate. Fruit orbicular, tenfurrowed.

The *Cicuta maculata* is an umbelliferous plant, inhabiting wet meadows and the banks of streams, from the northern to the southern limits of the United States, flowering in July and August.

The root is composed of a number of large, oblong, fleshy tubers, diverging from the base of the stem, which are frequently found of the size and length of the finger; distinct cells or cavities are to be found on various parts of the bark, which are filled with a resinous juice of a yellow color. The plant is from three to five feet in height, with a smooth stem, branched at the top, hollow-jointed, striated, and generally of a purple color, except when the plant grows in the shade, in which case it is green. The leaves are compound, the largest being about three times pinnate, with the exception of the uppermost, which are ternate. Most of the petioles are furnished with large obtuse stipules, which clasp the stem at their base. The leaflets are oblong acuminate, serrate, with very acute serratures. The flowers grow in umbels of a medium size, without a general involucre, the partial umbels are furnished with involucres of very short, narrow, acute leaflets. The calyx is composed of five very minute segments. There are five white, obovate petals, with inflated points. The fruit is very nearly orbicular and compressed, with ten furrows, crowned at top, and separating into two semicircular seeds.

Chemical History.—A cold infusion made from the seeds by maceration and displacement was of a dark brown color, and gave an acid reaction with litmus.

Albumen.—The cold infusion was coagulated by heat, showing the presence of albumen.

Tannic Acid.—When the tincture of muriate of iron is added to the cold infusion, a greenish-black precipitate is produced, and a solution of gelatin is also readily coagulated by it, showing the presence of tannic acid.

Gum.—To an infusion made with boiling water a solution of subacetate of lead was added till it ceased to produce a precipitate; this was suspended in water, and the lead removed by a current of hydrosulphuric acid; on evaporating the filtered solution to dryness, a substance was left which was soluble in water

but not in alcohol, and which yielded mucic acid by the action of nitric acid.

Fixed Oil.—A portion of the bruised seeds was treated with ether, and the resulting tincture evaporated, until it ceased to have weight, when about five per cent. of a very thick, greenish, greasy matter was obtained, consisting chiefly of fixed oil, with resin and chlorophylle.

Resin.—An ethero-alcoholic tincture was made by displacement, and evaporated to a syrupy consistence, then thrown into water, when about three per cent. of impure resin was precipitated.

Volatile Oil.—One pound of the bruised seeds were distilled with water acidulated with sulphuric acid; seven per cent. of a colorless, very limpid volatile oil passed over, having an insipid, oily taste, and an odor very analogous to that of oil of *Chenopodium anthelminticum*; has a specific gravity of .858, and boils at 860° F., without undergoing any change; is soluble in alcohol, ether and chloroform; it dissolves a large quantity of sulphur by heat, and deposits most of it in crystals on cooling; phosphorus is also readily taken up by the oil, with the aid of heat, and also crystallizes on cooling; sulphuric acid decomposes and blackens the oil with the evolution of heat; muriatic acid gas passed through it is largely absorbed, and decomposes the oil, changing its color to a dark brown, without any deposition of resin; and the same reaction takes place with chlorine.

Nitric acid acts on it powerfully. When added to the oil an explosion follows, by which most of it is thrown from the vessel, the residue, on standing a few hours, deposits a thick resinous matter, heavier than water, which, when well washed with warm water, and distilled with potassa, afforded a substance having a very agreeable aromatic odor. The volatile oil of *Cicuta maculata* is neutral to test paper, but rapidly ozonizes air enclosed with it in glass bottles exposed to the light, and in this respect it is more active than oil of turpentine. The corks of the vials containing it are bleached as though acted on by nitric acid, and when a slip of paper moistened with iodide of potassium and starch water is suspended in a vial above the oil, the iodide is instantly decomposed, setting free the iodine, showing the pre-

sence of a large quantity of ozone in the atmosphere of the vial.

When treated with bichromate of potassa and sulphuric acid it yielded by distillation an acid analogous to formic acid.

Potassium, when added to the oil, decomposes it with effervescence, materially affecting its odor, and on standing causing it to become solid; the potassa formed from the oxidation of the potassium, uniting with a portion of the oil to form a compound-like resinate of potassa, having a dark brown color and a soft solid consistence.

About two drachms of the crude oil was treated with potassium until reaction ceased, when it had assumed a dark brown color, and thick consistence; the whole, with a portion of potassium, was introduced into a retort, and by a careful application of heat, a colorless hydrocarbon oil distilled over, of the sp. gr. .830, having a pleasant odor, and a bland aromatic taste; it is rendered dark red by the action of sulphuric acid; caustic potassa digested in the oil does not affect it; nitric acid acts on it with effervescence but without exploding.

Caustic potassa added to the crude oil changed it, after standing, into a solid of a dark red color, (the odor was similar to that produced by the action of potassium,) this was treated with water and filtered, a few drops of the solution of subacetate of lead was added to the filtrate, but it did not produce a black precipitate. Iodine combines slowly but perfectly, without explosion, becoming colorless on standing. A few drops of the volatile oil were placed on a watch glass, and exposed to oxygen gas under a bell jar for two or three weeks, without any apparent change in its consistence or color taking place.

Conia.—From the close botanical relationship between *Cicuta maculata* and *Conium maculatum*, and its known poisonous properties, it was presumed that a volatile alkaloid existed in the former, analogous, if not identical with conia. To decide this question, a portion of the seeds were bruised and macerated in diluted alcohol, acidulated with sulphuric acid for four or five days and displaced; the resulting tincture was evaporated to the consistency of honey, and treated with a mixture of alcohol and ether. This was also evaporated, and a portion of water added in order to dissolve the salt of the alkaloid, and leave the resin. A small

quantity of caustic potassa was then added to the solution, and the mixture distilled; the distillate had the strong mouse-like odor peculiar to conia, and was slightly ammoniacal. It produced a white precipitate with an infusion of galls, (tannate of conia,) and a white one with a few drops of a weak tincture of iodine. Part of the distillate was saturated with sulphuric acid and evaporated to dryness. The crystalline mass was treated with alcohol of 97 per cent., which left a residue of sulphate of ammonia. The alcoholic solution by evaporation afforded a crystalline product, which gave off a very powerful odor of conia when a few drops of solution of potassa was added to a portion of it. If too great an excess of potassa is used in the process, it probably decomposes a considerable part of the conia, as it is well known that this alkaloid, under such circumstances, is changed. This accounts for the presence of the ammoniacal salt, which could not have come from the seeds, as sulphate of ammonia is insoluble in the ethereo-alcoholic menstruum used in the preliminary steps of the process.

The seeds contain a large portion of dark brown coloring matter, which is dissolved out by alcohol and water; and also contain chlorophyll as their color would infer, the presence of which is evinced by the ethereal tincture having a dark green color.

Two ounces of the bruised seeds were boiled with milk of lime and filtered, the lime salt thus formed with the acid was carefully decomposed by sulphuric acid, and the solution filtered. This was evaporated to dryness, and treated with warm water, to which some animal charcoal was added, and boiled, the charcoal was filtered out, and the solution again evaporated to dryness, and then treated with alcohol as long as that liquid gave an acid reaction to litmus. This was also evaporated to dryness, and dissolved in water, which solution, on being evaporated in a capsule, deposited the acid in a crystalline form, which I presume is the substance found by Peschier in *Conium maculatum*, and designated by him as conic acid. It is soluble in alcohol, ether and water, and is carbonized and destroyed by heat. The solution of subacetate of lead is precipitated; this acid and the lead salt when dissolved by nitric acid, is not precipitated by chloride of barium.

From the foregoing experiments the seeds of *Cicuta maculata*

contain albumen, tannic acid, gum, fixed oil, resin, volatile oil, chlorophylle, coloring matter, conia, and a peculiar acid, probably the conic acid of Peschier. The tops and leaves were treated in the same manner as the seeds for conia, but it existed in such a small quantity that I could only detect it by the odor, and by the production of white vapors when subjected to the action of hydrochloric acid gas.

The flowers when immersed in water and subjected to distillation, yielded a very small quantity of volatile oil, analogous to that obtained from the seeds.

The cicuta root, in taste and odor, very much resembles the common parsnip. In drying, three-fourths of its weight is dissipated in moisture. The hot infusion, when treated with solution of acetate of lead does not sustain any reaction; but the presence of starch is indicated in the same by a bluish black precipitate, when treated with the tincture of iodine. The presence of conia could not be detected in the root, but this may be accounted for by the fact, that the specimen examined was collected late in October, when the vital force of the plant had probably been exhausted in seed bearing.

PREPARATION OF CITRATE OF IRON AND QUINIA, AND ITS CONSTITUENTS.

By EDWARD R. SQUIBB, M.D. Passed Assistant Surgeon, U. S. Navy.*

The experience of this laboratory with these preparations having become sufficiently definite to be useful, I offer the formulæ to the Journal for publication, under the conviction that the irregularity and uncertain constitution of the commercial article prevents a proper appreciation of the value of citrate of iron and quinia.

I have made this preparation seventeen times, in quantities varying between one ounce and five and a half pounds at a time. The proportions adopted in the formulæ are the result of experiment and practice, and were verified by calculation afterwards.

For general pharmaceutical application the formulæ are all

[* Dr. Squibb is the Assistant Director of the United States Naval Laboratory at Brooklyn.—EDITOR.]

based upon 480 grains of crystallized sulphate of iron; yet no particular modification of proceeding, or of time required in heating, digesting, &c., is necessary, if the proportions be not multiplied beyond five times.

The sulphate of protoxide of iron used was well crystallized and free from efflorescence, was in masses near the size of a filbert, dry externally, but affording a moist granular powder, adhering round the pestle and mortar when rubbed up. When rubbed up and dried for half an hour at 85°, efflorescence being avoided as far as practicable, 480 grains lost 16; and this was probably near the index of the accidental water. The salt was of a good greenish blue color, with but slight stains from peroxidation, and was made from the turnings of wrought iron, and the residue of the ether process.

The sulphuric acid used was the commercial acid, s. g. 1.855, but contained a larger proportion of sulphate of lead than usual.

The nitric acid used was pure, as obtained by redistilling the commercial acid and rejecting the first portions. It had the usual density of acid so obtained, viz., s. g. 1.41.

The solution of ammonia was of the officinal, [U. S. P.] and not the commercial strength.

The citric acid was the ordinary crystalline masses; and the sulphate of quinia that of Powers & Weightman, of Philadelphia.

Hydrated Peroxide of Iron.

Take of Sulphate of iron,	℥l.
Sulphuric acid,	grs. 86, or ℥ 47.
Nitric acid,	grs. 90, or f. 31.
Solution of ammonia	f. 32, f. 31.
Distilled water,	q. s.
Water,	q. s.

To f. 34 of distilled water in a six ounce beaker, add the sulphuric acid and heat the mixture in a water bath. Then add successively the nitric acid and sulphate of iron in crystals, and heat the whole with occasional stirring for an hour and a half, supplying the loss by evaporation with distilled water. Dilute the solution with two parts of distilled water and filter it into a half gallon beaker, and wash the filter through with f. 310 of distilled water. Then add the solution of ammonia and stir till a smooth equable mixture is formed, when the vessel is to be filled

up with water and again stirred. When the precipitate shall have subsided, decant the supernatant liquid and again fill up the vessel with water and stir the mixture. Repeat this washing the precipitate four times, or until the washings give no cloudiness with solution of chloride of barium. Then transfer the oxide to a strainer, and drain it till it can be heaped up with a spatula. It will then weigh about $34\frac{1}{2}$, and if dried by sulphuric acid under a bell glass will yield 174 grains of terhydrated sesquioxide of iron. Or if dried on a sand bath and subjected for 15 minutes to a red heat, it will yield 134 grains of sesquioxide of iron. The yield, by calculation, from 480 grains, Fe O , $\text{SO}_3 + 7 \text{HO}$, should be 184.747 grs. $\text{Fe}_2 \text{O}_3 + 3 \text{HO}$, or 138.128 grs. $\text{Fe}_2 \text{O}_3$.

It is better to heat the sulphuric acid and water first, and to add the sulphate of iron immediately after the nitric acid, as this avoids loss of nitric acid by evaporation. It is better also to add the sulphate at once, and in lumps as it occurs, as the effervescence is then moderate, and there is less risk of loss by spilling, or the spitting of the effervescence. Hence, also, the utility of a proportionately deep vessel, and a quantity of water so small as not to cover or embrace the whole of the salt at once. The peroxidation is probably accomplished as rapidly as the salt can be dissolved, for I have never been able to get a clear indication of protoxide in the solution, even when tested before all effervescence had ceased. During the prolonged heating, however, nitrous fumes are given off even for many hours, and long after the solution of the sulphate of peroxide of iron is perfect. An hour or an hour and a half of heating gets rid of most of this entangled or dissolved nitric oxide, and in practice seems quite sufficient to prevent its interference in the precipitation. The large dilution of the solution before precipitation is useful, for it renders the resulting precipitate more readily soluble. It is better to wash the oxide by decantation, because it is better, more easily, and much more speedily done. By decantation, with a piece of India rubber tubing as a syphon, the washing can be well performed in two hours, without any contact of air till the magma comes to be drained on the strainer. Here it invariably gets a little carbonic acid.

In making the oxide hastily as an antidote, the prolonged heating, the large dilution of the solution, and three of the wash-

ings may be omitted, as also, in case of great emergency or bad filtering paper, the filtration. The precipitate as soon as formed should be thrown into the centre of half a yard square of muslin and squeezed out twice, once from the mother liquid, and once from clear water. The antidote can be efficiently prepared from four ounces of the commonest copperas, and the solution of the sulphate of peroxide filtered before precipitation, in twenty-six minutes. This, however, is much too long to wait for an antidote, and is only recommended as a substitute in case the much better plan of Prof. Procter (see this Journal for March 1853), shall have been neglected.

Citrate of Iron.

Take of Citric acid in crystals,	grs. 330.
Magma of hydrated oxide of iron from	} 34½.
the first formula, the entire yield,	
Distilled water,	f. 34.

Warm the magma to about 150° in a six ounce beaker, in a water bath, and in the same bath dissolve the citric acid in the water in a separate vessel. Then add the acid solution to the magma and stir occasionally for three hours, maintaining a temperature between 140° and 180°, and finally filter through paper and pour the solution on plates to dry.

This process takes the oxide and acid in very nearly equivalent proportions, and yields 455 grains of dry citrate, or very nearly the sum of the *dry* acid (270.9 grs.) and the hydrated oxide (174 grs.)

The salt consists of Peroxide of iron 131 grains, or 28.8 per cent.

Citric acid,	271	"	59.56	"
Water,	58	"	11.64	"

As the acid is tribasic, and the salt strongly acid in its ordinary reactions; and as the peroxide of iron requires three equivalents of an acid to afford a normal salt, it follows that this citrate of iron is a very imperfect salt, unless water combines with its acid as a base, and also with its base as an acid.

The acid will not be saturated short of two or three hours, under the best management and frequent stirring; and, therefore, if at the end of such a period there is much turbidity or sediment in the mixture, it had better be left in a warm place over night before being filtered.

If, during the solution, the temperature rises above 205° , the process is very nearly, if not entirely, arrested before saturation ; and if the solution boils, a precipitate occurs were none existed. With the proportions indicated there is always a little residue of oxide remaining on the filter, though the solution passes with facility. But where by mismanagement of the proportions, as in the formula of the Pharmacopœia, the quantity of undissolved oxide is considerable, it so clogs the filter that days are required to get a few ounces of dilute solution through good paper or muslin. While decantation is not well adapted to the separation of dark colored liquids from their sediment, and will not afford a perfectly clear solution without great loss.

It is better to dry the salt slowly, and in thicker lamina than is common, as it thus is much less bulky. A two ounce bottle is required for an ounce of thin scales ; but after an ordinary transportation, these scales are found so broken up that the bottle is only two-thirds filled by them. The thicker lamina, on the other hand, require much longer time in drying, but yield a finer preparation, an ounce of which is easily put into an ounce vial.

Quinia.

Take of Sulphate of quinia that has been exposed

to a warm, dry atmosphere for 6 hours, grs. 78.

Sulphuric acid, grs. $11\frac{1}{2}$ or m. 6.

Solution of ammonia, f. 3 $2\frac{3}{4}$.

Water, q. s.

Mix the acid with f. 36 of water, and dissolve the sulphate of quinia in the mixture by stirring. Filter the solution if necessary, and then add the solution of ammonia, and stir for ten minutes. Throw the whole upon a thick strainer and wash with a small continuous stream of water till the washings give no cloudiness with solution of chloride of barium. Allow the magma to drain to the consistence of a curdy paste and then transfer it to a vessel, or to the solution of citrate of iron as it comes from the filter.

I have weighed, at different times, the contents of 14 bottles of the sulphate of quinia of Messrs. Powers & Weightman, of Philadelphia, and found them to vary from 432 to $443\frac{1}{2}$ grains each, the total being 18 grains deficient.

The contents of a bottle weighing 442 grains, exposed in a

capsule in a moist atmosphere at 72° for one hour, lost 10 grains. In nine hours it had lost 47 grains, and then ceased to lose. It was then placed in dry air at a temperature varying from 100° to 160° , where in fourteen hours it weighed 380 grains, and ceased to lose. Exposed again under the first mentioned conditions it, in sixteen hours, weighed 395 grains.

Exposed again to dry hot air for 7 hours it weighed 377 grains.

"	"	"	moist air at 72° for 16 "	"	"	391½ "
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"	"	"	hot dry air " 8½ "	"	"	377 "
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"	"	"	moist air at 72° " 15 "	"	"	392½ "
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"	"	"	ordinary air and temp. for 1 week,	"	"	392 "
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It was then dissolved and precipitated by the formula given when it yielded 300 grains of quinia.

The contents of another bottle, weighing 432 grains was similarly treated. In five hours it weighed 382 grains, and when precipitated and well dried, it yielded nearly 290 grains. Other bottles (three) of intermediate weights were examined in a similar way, and the mean yield of quinia from the whole was $293\frac{1}{2}$ grains to each commercial "ounce" of sulphate. Now as 436 is the equivalent number of officinal sulphate of quinia, and as there are 437.5 grains to the avoirdupois ounce, it follows that there should be about 324 grains of quinia, 40 grains sulphuric acid and 72 grains of water of crystallization in each commercial ounce. But these experiments give $293\frac{1}{2}$ grains of quinia, 36 grains of sulphuric acid, and 108 grains of water, or about 10 per cent. of uncombined water.

Hence, as a practical result, it is safe to use each commercial ounce of this sulphate of quinia as 390 grains, after 6 hours exposure to dry air. The formula takes the fifth part of this, which under ordinary management will yield 58 grains of dry quinia.

In precipitating quinia the quantity of solution of ammonia should be carefully attended to, as there is loss in using too little or too much. The washing should be carefully performed on a strainer of thick jean. A wash bottle with small orifice is well adapted to the purpose, the water being allowed to trickle from it, and being continuously distributed over the whole surface of the precipitate. In this way, the washing can be perfectly done in 15 minutes with f. 310 of water, and the loss then is small.

When the magma has drained for a few minutes, it is in a good condition for solution. If the water be wrung or pressed from it, it is liable, in a few minutes even, to contract greatly, and become glutinous and difficult to manage without loss, by parting suddenly with much of its water of hydration.

Citrate of Iron and Quinia.

When the solution of citrate of iron from the first and second formulæ has passed the filter, the magma of quinia from the third formula should be added to it, and dissolved by a few minutes stirring in the cold. The solution is then to be poured upon plates and allowed to dry slowly, being well protected from dust.

The drying thus requires six days, if in moderately thick lamina, and yields a brilliant red granular salt of a crystalline appearance.

The yield will be 495 grains of dry salt, constituted as follows :

Peroxide of iron,	131 grains,	or 26.46 per cent.	
Quinia,	58	"	11.72 "
Citric acid,	271	"	54.74 "
Water,	35	"	7.07 "

It is better to add the magma to the solution of citrate of iron cold, as the quinia is thus more easily and quickly dissolved. If the solution is warmed, the quinia magma contracts and becomes sticky, requiring much more time and stirring to effect the solution.

U. S. Naval Laboratory, New York, May 7th, 1855.

REMARKS ON CASSIA MARILANDICA.

By ELLISTON L. PEROT.

(Extracted from an Inaugural Essay presented to the Philadelphia College of Pharmacy.)

[The first part of this Essay, having reference to the botanical and chemical characters of the plant, is omitted, as nothing new was elicited beyond the results of J. J. Martin, published in vol. vii. of this Journal. Mr. Perot isolated a deliquescent substance by the process for cathartin, and by repeated distillation obtained a small portion of volatile oil from the leaves. The latter part of the Essay, in reference to the therapeutical value of this plant, is published entire, because it appears to be at variance with the received opinions of American medical writers. We hope the subject will attract

the attention of physicians who have used the American senna, and induce them to give their experience in regard to its activity as a cathartic, compared with the imported drug.—EDITOR AM. JOUR. PHARM.]

In order to test the medicinal properties of the American senna, I thought best to do so by making a fluid extract, and comparing its virtues with those of a preparation from the imported article. Two different collections of the plant were made, one in the month of August and the other in September. The first was in full bloom, and the other had ripened and bore its fruit in fine clusters, which was a pendulous legume, several inches in length, and of a dark color. From these two collections two preparations were made according to the official formula, as follows :

R. American senna, August collection,	8½ oz.
Alcohol,	Oj.
Water,	Oiss.

The leaves were macerated in the diluted alcohol for twenty-four hours, and then displaced until Oij. of liquid were obtained ; these were evaporated to f.3v., filtered, and 3vss. of sugar added, which was dissolved by the aid of a gentle heat. To the fluid extract thus obtained, I then added f.3ss. of Hoffman's Anodyne with f.3¼ of oil of fennel dissolved in it. A similar preparation was made from the September gathering, and one also from some leaves obtained from the Shaker settlement.

Through the kindness of Dr. Martin, of the Philadelphia Dispensary, I am enabled to state the relative virtues of these different collections, as follows : The first case in which this extract was tried was that of a married man suffering with an acute attack of pleurisy ; his bowels were moved with calomel and rhubarb on the first day of the treatment, and followed with ten grains of Dover's powder at bed time. The next morning one tablespoonful of the fluid extract made from the August gathering was administered, and in six hours another, without producing an evacuation, and it required a full dose of a purgative medicine to produce the desired effect.

The second case was that of a married woman who was suffering from catarrh ; for her, one fluid ounce of the extract from the September collection was prescribed, with directions for taking the same, but she returned the next day without having had an evacuation.

Case third was also a married woman with an attack of neuralgia. Two fluid ounces were administered here without effect.

Case fourth was a married woman with inflammation of the mammæ. One and a half fluid ounces of the extract prepared from the Shaker senna was given, and no effect produced.

Case fifth was one in which one and a half fluid ounces were given of the above to a man, but without any action.

There were several other cases in which this preparation was administered, but all resulted as above ; thus proving most conclusively that the *Cassia Marilandica* is very weak, if possessing any purgative properties at all, and entirely inferior to the imported senna ; having signally failed in all cases in which it was tried. There was one other case in which it was given in combination with epsom salts, but the effect produced was no more than that from the last named purgative.

The above experiments, carefully performed by Dr. Martin from preparations of the plant in its greatest state of perfection, prove, in my opinion, that its therapeutical qualities have been overrated, and that it does not possess the virtues which have been ascribed to it by the medical profession ; and thus this previously unsettled question is finally determined, that the *Cassia Marilandica* possesses no cathartic properties that would entitle it to be used as a substitute for the other varieties of senna.

ON FLUID EXTRACT OF ERGOT.

By T. ROBERTS BAKER, of Richmond, Va.

In a former paper upon Ergot, published in the *American Journal of Pharmacy*, of April, 1852, the subject was treated purely in its chemical relations.

In that paper were given the entire results of my analysis of ergot, together with the processes resorted to for extracting the different constituents. Since the period referred to, I have prepared a fluid extract of ergot, availing myself of the processes employed in, and the numerical results of, my analysis, as the basis of operations.

When we consider the uncertainty attending the administration of powdered ergot, owing to the inferiority of the article before powdering, or its liability to deviate when kept powdered,

together with the objectionable size and character of the dose, the advantages of a preparation combining the valuable properties of ergot to the exclusion of the inert constituents, which only serve to increase the bulk of the dose, are apparent. The use of the formula given below, will secure such a preparation :

R. Ergot, freshly powdered, 2 lbs. avd.

Ether,

Alcohol 80 per cent.

Water,

Simple syrup, *aa.*

q. s.

1st. Displace the ergot with ether until the menstruum comes through nearly colorless, and evaporate spontaneously to procure the oil.

2d. Next displace with the alcohol to exhaustion, and evaporate by water-bath to a thin syrupy consistence.

3d. Next, displace to exhaustion with the water, and evaporate the resulting liquid as fast as it is obtained, in order to guard against chemical changes. Then strain to separate albumen; after which mix it with the alcoholic extract, and evaporate the whole to a syrupy consistence. The evaporated mixture of the aqueous and alcoholic extracts should then be incorporated with the oil first, and afterward with sufficient simple syrup to make up the measure of two pints. To each fluid drachm of this add one minim of oil of peppermint.

The dose of this preparation is a fluid drachm, which represents two scruples of powdered ergot.

Upon reference to the description of the analysis alluded to in the first part of this article, it may be seen that the arrangements for displacing in preparing the Fluid Extract of Ergot are in reverse order to those used in making the analysis. My reasons for this change in the arrangement are based upon the information developed by the analysis, and are as follows. As the ether is used for the extraction of the oil only, those constituents which required other solvents were calculated to retard and prevent by their presence the entire extraction of the oil in the isolated condition—for one of the resins of ergot is also soluble in ether—and coming away with the oil would, in a quantitative analysis, serve only to multiply processes; hence the necessity, in making a quantitative analysis, of employing the ether last,

or after every other available solvent has been used. But, in making a Fluid Extract of Ergot, the object will be to present the valuable constituents recombined, which, as will be shown, requires the treatment for analysis to be reversed. If the solutions obtained by the different menstrua employed have to be recombined, it follows that the solution first obtained must be reserved until that last obtained has exhausted the material under treatment; and as aqueous solutions of organic substances are very liable to chemical change when kept, the necessity of employing the water last is apparent. On the other hand, the necessity for using the ether first in displacing for a fluid extract is also apparent, as it brings away with the oil one of the resins insoluble in the different menstrua subsequently to be employed, and thus removes an impediment to the success of the processes which follow.

ON SOME PHARMACEUTIC PREPARATIONS.

By JOHN T. PLUMMER, M. D.

Liquor Morphiæ Sulphatis, U. S.—I do not know that any of our authorities speak of this preparation as being any other than a permanent solution. According to my experience, however, it certainly ought to be classed with the extemporaneous remedies. That it was not likely to be a durable solution might, indeed, have been inferred from the nature of the constituents. But as it is desirable to have a lasting preparation of this salt in a fluid form, without objectionable additions, I devised the following formula some years ago, and have made my solutions of sulphate of morphia according to it ever since; and as the experience of several years has satisfied me of the durability of the preparation, as well as of the efficacy of it as a therapeutic agent, I feel no hesitancy in recommending it.

℞. Morphiæ Sulphatis, grs. viii.
 Aquæ destillatæ,
 Syrupi ana f.℥iv.
 Spt. Etheris Comp. f.℥i.

Dissolve the salt in the water, add the syrup, shake the mixture, and then add the Hoffman's Anodyne.

If this solution should prove to be too thin a syrup for warmer

latitudes, it would be corrected by increasing the proportion of official syrup. I have made the preparation of different degrees of consistence : in the foregoing formula the proportion of syrup is reduced, perhaps, to its lowest practicable point to retain the character of a syrup. If it is desirable, sometimes, to have a solution free from saccharine matter, it is probable that a more permanent preparation could be obtained than the present official one, simply by the addition of Hoffman's Anodyne to it. But in this case there would be an obvious precipitation of the ethereal oil of Hoffman's Liquor, which appears scarcely to disturb the transparency of the *Syrup*, and there would be also the increased facility of evaporation of the protective fluid. Experience, however, will best determine the feasibility of this aqueous preparation.

I have labelled this preparation, for my own convenience in prescribing, *Syrupus Morphice Sulphatis Compositus*. The compound spirit of sulphuric ether is added in order to preserve the thin syrup from decomposition ; in much larger quantities it would have the advantage of co-operating with the salt of morphia as an anodyne, but as in each fluid drachm of the syrup there is but one thirty-third part of it Hoffman's liquor, it can exert but little power as a co-adjuvant of the morphia.

Galbanum.—It is stated in our excellent U. S. Dispensatory, that this gum resin. "in the United States is never prescribed internally." And under the head of *Tincture of Galbanum* a similar observation is made concerning this preparation. And I believe the tincture is not recognized, either in the U. S., the London, or the Edinburgh Pharmacopœia.

From my own observation, I judge that the above quotation from our Dispensatory is substantially correct, having never known the medicine to be prescribed by others, except in a few instances at my own instigation. I may say, however, that I have prepared and used the *Tinctura Galbani*, made according to the Dublin Pharmacopœia, from an early period of my medical practice, and I should now, after a length of twenty-seven years in the profession, be at a loss to find a substitute for it.

It is by no means a potent remedy, as we find the article in this country, but it properly belongs to that class of milder therapeutic agents which we cannot well dispense with, while they

procure relief from those numerous morbid annoyances which, though not fatal in their tendency, we are not generally willing to submit to without an effort to alleviate, if not to cure.

Syrupus Capsici.—I have for some years past prepared a syrup of capsicum by the same method employed in the manufacture of syrup of ginger. The process makes a beautiful preparation, serviceable in many affections of the throat, in which a local stimulus of the kind is desirable. If the addition of a little acetic acid to this syrup should be thought proper in any case, it can be made without detriment to the transparency or pungency of the preparation.

Magnesiae Sulphas.—In 1847, in a Report on the Progress of Materia Medica and Pharmacy, given in the Half-Yearly Abstract of the Medical Sciences, it is said that sulphate of magnesia has “been carefully studied by Ladomir Combes, especially in relation to the best mode of concealing its bitter taste. After a number of trials, he at last succeeded in affecting this by the simultaneous administration of tannin or coffee; the former, however, is the active agent. The peculiar astringent taste of the tannin may be removed by the addition of an agreeable aromatic. In roasted coffee we have both these advantages combined.” And it is added: “this fluid [the decoction of coffee and salts] does not impart the slightest taste of the bitterness of the salts.”

These statements were republished in other works; but beyond this, I have seen no testimony on the subject, either affirmative or negative.

To satisfy myself in relation to it, I boiled together, on the 9th of 4th mo. 1854, in a Florence flask, for two or three minutes,

Sulphate of Magnesia	℥ss.
Ground Roasted Coffee	ziss.

The coffee had been well roasted, and was of fine flavor. After the decoction was partially cooled, it was filtered into a glass bottle of such size as to leave two-thirds of it empty. After corking the vessel, it was set aside in a shady part of my office, undisturbed for forty three days. At the expiration of this time, I discovered upon the surface of the fluid, that two centres of mold had formed.

The taste of the decoction, at the time that it was prepared, proved to be quite palatable, at least to a coffee-drinker; the bitterness of the salts was barely perceptible; and then not until after the liquid was swallowed. Although the taste was almost unobjectionable, the odor of the fresh decoction too much resembled that of beef's gall to be agreeable. But now, at the end of the period named, that odor was supplanted by the more pleasant aroma of cold coffee; and there was little or no abatement in the agreeable taste of the preparation.

Without disturbing the two spots of mold, the bottle was again corked, replaced in the same situation, and left for forty-eight days longer. The decoction had now been made ninety-one days, and had been exposed to a temperature of from 40° to 70° Fah. The two moldy centres had by this time enlarged and coalesced, so as to occupy about one fifth the whole surface of the liquid in the bottle. There was, also, a curdy deposit at the bottom of the vessel resembling coagulated albumen. The decoction itself was dark as usual, and perfectly clear. The odor of coffee was nearly gone. The flavor of cold coffee was yet apparent enough almost entirely to conceal the bitterness of the sulphate.

The whole liquid was now passed through Swedish filtering paper, the bottle well washed, and the filtrate replaced in it. After twelve days repose in the same situation, a spot of mold was again formed on the liquid; the lower end of the cork was covered with it, and the air in the bottle had a musty odor, mingled with that of coffee. There was also a fresh deposit resembling very fine "coffee grounds." The mold continued to spread for eight or ten days more, when I discontinued the experiment.

It does not appear from my use of this preparation in medical practice that the salts lose any of their cathartic power by the presence of the decoction of coffee.

Richmond, Indiana, 5th mo. [May,] 1855.

CHEMICAL NOMENCLATURE.

By J. CHESTON MORRIS, M.D.

In the March number of this Journal I drew attention to some infringements on the laws of nomenclature; in the May number is an answer by Dr. Bache, to my article, which seems to me to call for a more distinct statement, on my part, of the mooted point. The whole question lies in a nutshell, and resolves itself into an inquiry as to what is generally received among chemists as the law. As to the preferableness of one plan or the other for teaching students, we ought never to sacrifice truth to expediency, —so that even if the “equivalent composition principle,” were easier to remember (which I beg leave to doubt) yet less correct, according to established chemical usage, we would not be justified in adopting it—such a course would lead inevitably to the confusion I have already pointed out.

Fownes says, in the last American edition of his chemistry, p. 200 :—“When a powerful oxygen acid and a powerful metallic base are united in such proportions that they exactly destroy each other’s properties, the resulting salt is said to be neutral: it is incapable of affecting vegetable colors. Now, in all these well characterised neutral salts, a constant and very remarkable relation is observed to exist between the quantity of *oxygen* in the base, and the quantity of *acid* in the salt. This relation is expressed in the following manner: To form a neutral combination, as many equivalents of acid must be present in the salt as there are of oxygen in the base itself. *In fact this has become the very definition of neutrality, as the action on vegetable colors is sometimes an unsafe guide.*” The italics are mine. This is the only authority quoted by Dr. Bache; hence, I think it sufficient to have shown how entirely he supports my view, only adding that the language of every standard chemical work I am familiar with is the same. As to the name bestowed on the law I am advocating, I think it would be better expressed as the “law of neutrality of composition,” to indicate that it refers not so much to the action on vegetable colors as to the proportion of the components of a salt.

I acknowledge a preference for the terms protosulphate, deutosulphate, &c., for ordinary use, to sulphate of the pro-

toxide, deutoxide, &c.; they are neater, shorter, and therefore easier remembered. And if the rule is universally adopted among chemists (as it seems likely to be) that such prefixes shall always denote the state of oxidation, we shall gain a clear and comprehensive mode of expression. But the law I have been defending must be acknowledged and observed first, or this latter one fails of expressing distinctly the composition of salts. Perspicuity, exactness and brevity are the three desiderata in a nomenclature; and I leave the reader to judge between the following expressions, supposing for the sake of argument that there were two systems, upon either of which we might base our expressions, instead of only one, as I have already shown.

Monosulphate of the protoxide of iron.	}	Protosulphate of iron.
Tersulphate of the sesquioxide of iron.		Sesquisulphate of iron.
Bisulphate of the deutoxide of mercury.	}	Deutosulphate of mercury.

It strikes me that any one having an ordinary acquaintance with chemistry would pronounce the latter superior in all three points to the former.

Philadelphia, May 31, 1855.

ON A METHOD OF PRESERVING ERGOT.

By DR. R. J. NUNN, of Savannah, Georgia.

The effectual preservation of ergot of rye has always been a matter of considerable moment. The following method, therefore, which I have adopted and successfully used for many years, may not be uninteresting to some of your readers.

The object to be attained in all such attempts, must be to insure the perfect exclusion of atmospheric air and moisture, and at the same time, preserve the material from the action of parasites, these requirements may be perfectly fulfilled by treating the substance in the following way:

Having obtained some ergot on the quality of which reliance can be placed, let it be reduced to a coarse powder, (for which purpose an ordinary coffee mill will amply suffice) and made as dry as convenient—it is preferable but not absolutely necessary

that the powder should be thoroughly dried at a temperature not exceeding 139° F. Next prepare a solution of camphor in ether. 80 grs. of camphor to 3j. ether will be found to be a convenient strength for small bottles; have ready some strong ounce bottles, cleaned and dried. As it is important the bottles should not be damp, it would be well either to dust them out without wetting, or if washing is preferred, let them be well dried in a drying closet before use; finally, provide for the vials some good tightly fitting velvet corks.

Into one of the bottles put a drachm of the solution of camphor above mentioned, and immediately begin filling with the dry powdered ergot; with a suitable instrument press the powder very tightly several times while filling, and continue the operation until the bottle is quite full of the closely compressed powdered *spermocidia*.

On examining the appearance of the contents of the bottle, the lower half will be observed to have a dark, damp look, while the upper part will still preserve the light brown color of the dry powder; the line of demarcation will, however, be observed to be slowly ascending, when the whole of the ergot in the vial has a moist appearance, which is a criterion that all the atmospheric air has been expelled and its place occupied by camphorated ethereal vapor; about half a drachm of the solution of camphor should be poured in, and the bottle immediately corked very tightly. The tops may now be covered with sealing wax.

If larger or smaller bottles are used, the proportion of the preserving solution should, of course, be relatively increased or diminished. Should the ergot be preserved in large bottles, and if it be subsequently desired to distribute it among a number of smaller ones, the above process must be gone through precisely as if the ergot were being put up for the first time.

The bottles should be examined occasionally; and as long as the ergot appears damp, the efficacy of the drug may be relied on. As soon, however, as any part of the powder presents the slightest indication of dryness, the bottle should be opened, about a drachm of the solution of camphor added, and then quickly restopped with new corks.

The use of sealing-wax as a coating for the corks may appear rather inappropriate on a bottle partially filled with ethereal

vapor, but it serves the very useful purpose of being an excellent check on the proper preservation of the contents; for if the bottle be examined occasionally, during a few days after it is laid aside, and the wax be found to retain its hardness, it may be reasonably concluded that the vial is effectually closed; but if the wax be at all softened, it indicates some inaccuracy in the stopping; the cork should in this case be immediately withdrawn, about half a drachm of the preserving solution poured in, the vial re-stopped with a new cork, and finally the wax re-applied.

Too much stress may seem to be laid on the apparently trivial circumstance of the use of good velvet corks; but it must be remembered, the success of the process depends almost entirely on them, for it will be found by practice to be almost impossible to insure the perfect closure of the mouth of the bottle with any but this kind of stopper, as the vapor of the ether readily passes through the pores in the inferior varieties of corks.

The heat of the water used to make the infusion of ergot, is amply sufficient to vaporize and expel every particle of the camphor and ether required for its preservation.

It may be appropriate to mention, that I have administered ergot which had been preserved in this way for over eight years, and could not appreciate the least deterioration in its efficacy.

The above principle might, I think, be advantageously applied to the preservation of other substances, and anhydrous alcohol or some other suitable liquid substituted when ether would be inadmissible.

Savannah, June 4th, 1855.

AMERICAN EXTRACT OF LIQUORICE.

BY THE EDITOR.

It may not be known to many of our readers that of late years a considerable amount of extract of liquorice has been prepared in this country from the dried root of *Glycyrrhiza glabra* imported from the Mediterranean. This manufacture is chiefly conducted at the laboratory of the Messrs. Tilden, at New Lebanon, Columbia county, New York, well known for their extensive opera-

tions in the cultivation of medicinal plants and the preparation of extracts. They find it necessary to employ a good quality of root to get the extract in its most desirable form, much of it being so badly cured as to be unfitted for this use. The drug is coarsely ground, subjected to the action of condensing steam in a large extracting vessel, and the concentrated infusion thus obtained transferred to vacuum pans and rapidly reduced to extract without access of air, and consequently without the formation of that large proportion of altered extractive matter that is found in even the best Calabria extract. Owing to the same cause the color is much lighter. They are now making about 100 pounds of this liquorice ball per day, and expect the current year to consume about 200,000 lbs. of the dried root. The extract is thrown into the market in three forms: in boxes of 25 lbs. weight, into which the extract is run in mass whilst in a soft state; in small rolls, of eighty to a pound, intended for medicinal use; and in the form of *lozenges*, put up in boxes like the Pontefract liquorice of England. The last two forms of the extract contain a portion of gum arabic, to give it firmness, so that it will not lose its shape. This has been found absolutely necessary as a substitute for the large quantity of insoluble apotheme in the European extract, which acts as a skeleton or framework to retain the form of the rolls. No other kind of gummy matter is used for this purpose, and its introduction in no wise interferes with the employment of the extract for medicinal purposes.

We have examined the extract in mass; its color is at first light brown, becoming on the exterior, by age, much darker, especially if it has become damp. Although firm in cool weather, it settles down in the warm season, and cannot be prepared in the form of rolls for reasons before noticed. The specimen in our possession, which is several years old, has the following characters: It is almost entirely soluble in cold water, is precipitated by dilute sulphuric acid, has a slight odor, analogous to that of Calabria liquorice when moistened, and a sweet peculiar taste, more like that of liquorice root than the imported extract. For medicinal use, this variety of "liquorice" possesses advantages which should lead to its employment; among

these, its greater purity and more complete solubility and agreeable taste are foremost.

Several years ago we believe an experiment was made in the culture of the *Glycyrrhiza glabra* in New Jersey. We are not informed in reference to the causes of its being abandoned, but we do know that the plant will flourish in the vicinity of Bordentown, and even become a nuisance in a garden, by the roots extending themselves over the beds, and interfering with other plants.

A large portion of the liquorice ball imported into this country is used in the manufacture of chewing tobacco at the South, and for this purpose the pure extract of the Messrs. Tilden has been much liked. Whilst our Commissioner of Patents is engaged in so many praiseworthy efforts to introduce foreign useful plants, cereal grains, fruits, &c., which of late years have rendered the operations of that branch of the public service at Washington so acceptable, it would be well that medicinal plants should not be overlooked, and the possibility of the liquorice culture being extensively carried on in Virginia and the other Southern States is certainly worthy of a share of attention.

GLEANINGS—PHARMACEUTICAL AND MEDICAL.

Syrup, Essential oil and distilled water of Strawberries.—M. Stanislaus Martin, (*Jour. de Chimie Médicale, Avril, 1855*) recommends, that the berries be put in an earthen vessel with alternate layers of powdered sugar, placed in a cellar until the next day, and then thrown on a seive for the syrupy juice to drain off. This juice is put in a bottle and heated by Appert's method.* The strawberry syrup thus prepared is clear, of a beautiful color and agreeable odor and taste of the berry, and can be preserved a year without change. [Each pound of picked strawberries, requires a pound and three-quarters of sugar.—EDITOR.]

M. Martin obtains the essential oil by the following means: The fruit is crushed, strongly expressed to separate the juice,

* [Appert's method consists in placing bottles, loosely corked, containing a liquid to be preserved, in cold water, which is then heated till it boils, so as to coagulate the albumen, when present, in the liquid treated, and then, while yet hot, hermetically sealed.—EDITOR.]

which is put in a bottle with rectified ether. After two days contact, decant and mix the ethereal liquid with powdered sugar. This addition is repeated a number of times until the sugar has a sweet odor. The seeds should be removed from the juice before treatment by ether, else the disagreeable fixed oil they contain is extracted with the volatile oil.

Strawberries give a distilled water that does not become agreeable until five or six months old ; it is advisable to put salt in the water of the alembic. Distilled water of strawberries may be employed to aromatise lozenges and syrups.

Diuretic Wine.—M. Granel suggests the following as a diuretic preparation, viz: squill sliced, and digitalis leaves bruised, each two drachms; best cinnamon three drachms; acetate of potassa half an ounce; Madeira wine a pint. Macerate during eight days and filter.

The dose is a table-spoonful in the morning.

The dose may be increased to four spoonfuls a day: two in the morning and two in the evening, at least three hours after the last meal.

Traumatacin.—Dr. Eulenberg, of Berlin, gives this name to a solution of *gutta serena* in chloroform. He employed it in a case of inveterate psoriasis, and in eczema. It is applied so as to form a shining pellicle over the part affected, which is renewed daily. In three or four weeks the skin had lost its scaly character. A similar application to an eczematous eruption in the arm pits, cured it in three weeks.—(*Jour. de Chim. Méd.*)

Poudre du Caucase—Powder of Caucasus. Under this name a powder is sold in European commerce for destroying insects, as lice, fleas, ants, and the worm which eats furniture, which is derived from the leaves and flowers of *Pyrethrum caucasicum*.

This powder is said to kill insects by its odor, which is inert to man. It is used by laying it in a bag near the infected place, or dusting it on, or it may be made into a tincture with six parts of alcohol, and this solution applied with a brush. The smoke resulting from the slow combustion of the powder is said to be a sure preventive of these vermin when applied, which is readily done by holding a hot iron, on which the powder is thrown, in the places likely to be infected with vermin. M.

Chevallier, suggests that the common pellatory roots might answer equally well.

Chocolate Iron Lozenges.—M. Quevenne, in a communication to the Academy of Medicine, on reduced iron, has given the following recipe for chocolate lozenges, viz :

Take of Iron by Hydrogen, (Pulvis Ferri U. S. P.) 500 grs.

Vanilla Chocolate, 7000 grs.

Simple Syrup, q. s. or, 2500 grs.

Divide the chocolate into 666 nuts; moisten slightly their surface with syrup, and roll them in the powdered iron previously mixed with a little powdered sugar, so as to divide the iron equally among all the nuts, and afterwards cover them with a layer of sugar. Each lozenge contains $\frac{1}{3}$ of a grain of iron.—(*Jour. de Chimie Méd.*)

Chocolate iron lozenges each containing one grain of iron, are prepared by Mr. S. Simes, of this city, in which the iron, sugar and chocolate are incorporated together, and cut into oval tablets like ordinary lozenges, which is a much more managable method than the above.

Ergot of Wheat.—Dr. Grandclément, in his inaugural essay, (noticed in *Jour. de Chim. Méd.*, for May 1855) has called attention to the ergot of wheat, which is employed instead of rye ergot at Clermont-Ferrand in France. In reference to its properties, viewed in a mass, it looks like ergot of rye, but examined singly the two are easily distinguished. Ergot of wheat is less elongated, more in the normal shape of the grain, and the longitudinal striæ are less equally deep, one being more so than the rest. Ergot of rye varies in length from ten to seventy millimetres; on the contrary ergot of wheat varies from four to fifteen millimetres. The color of wheat ergot is very similar to that of rye, but is sometimes browner. Their taste is the same. The odor of wheat ergot is less disagreeable than that of rye, and neither of them will germinate.

Examined by the microscope, M. Grandclément found; 1st, that the sporules of wheat ergot are larger than those of rye ergot. 2d. That the mass of the first is exclusively composed of sporules; whilst in that of the second there are parts without a trace of them, and none where the mass is entirely formed of them. 3d. That there is no substance in wheat ergot parallel

with the amylaceous matter of rye ergot, either in regard to form, or reaction with iodine.

Ergotine prepared from wheat ergot by Bonjean's process, is different in characters from the ordinary, but the most striking difference between the two is, that wheat ergot is not liable to spoil and lose its efficacy by keeping, as is the case with rye ergot, even when reduced to powder, and as its therapeutic effects are the same in all circumstances, M. Grandclément thinks its use promises to be productive of advantage to practitioners.

Action of picric (carbazotic) acid on the economy.—Dr. Spring (*Scalpel*, in *Jour. de Chem. Med.* Mai 1855,) communicated to the Board of Health, of Liege, as the result of his experiments, that picric acid is an *acrid poison*, which possesses an action analogous to that of *Anemone pulsatilla*, of creasote, of briony and of *gratiola*; that in the dose of $3\frac{1}{2}$ to $4\frac{1}{2}$ grains it rapidly killed a rabbit, and that evident traces of inflammation are found in the digestive apparatus after death. Dr. Spring thinks this agent may give rise to serious accidents.

Syrup of Guaiac.—M. Mouchon (*Bull. Gén. de Thérap.*,) gives several formulæ for preparations of guaiac resin. The base of these is a tincture made with one part of guaiac to four parts of alcohol (56 per cent.) by displacement. To make the syrup of guaiac, half a pound of this tincture is mixed with a pound of syrup of gum arabic, and the alcohol distilled or evaporated off till the syrup weighs one pound.

Thus obtained, syrup of guaiac is very homogeneous, owing to the emulsionizing effect of the gum in suspending the resinous particles.

New Hæmostatic agent.—M. Monsel, military pharmacien, (*Gaz. Med. de Paris*, in *Jour. de Chim. M.*,) suggests the following solution as an efficient means of checking hæmorrhage :

Take of Tannic acid,	a scruple.
Alum, (free from iron)	five drachms.
Rose water,	twenty-five ounces.

Dissolve. This solution also possesses a remarkable antiseptic power on the blood with which it comes in contact.

Double salt of Quinia and Iron.—M. Langeli (*Presse Méd. Belge.*) has prepared a salt which he believes is a double salt of protoxide of iron and quinia with sulphuric acid. It is made by

dissolving an ounce of protosulphate of iron in six ounces of water, and adding to the solution an ounce of sulphate of quinia and a few drops of sulphuric acid to dissolve it. This solution is filtered, evaporated till a pellicle forms, and on cooling affords prismatic crystals of the double salt, strongly bitter, styptic, and white, very soluble in water and alcohol, and possessing an acid reaction.

Dr. Regnoli has employed this new product in several cases of cholera with great success.

Soluble Citrate of Magnesia.—M. E. Robiquet (*Jour. de Chim. Méd.*) suggests the following formula and manipulation to produce a soluble citrate of magnesia :

Take of Citric acid, a kilogramme,	(35½ oz., avoird.)
Carbonate of magnesia, 630 grammes,	(21½ oz., “)
Boiling water, 350 grammes,	(10½ oz., “)

Reduce the citric acid to coarse powder and dissolve it in the boiling water. When the solution is cold, and before it crystallizes, pour it into a wide earthen vessel, and by means of a seive distribute the carbonate of magnesia evenly and rapidly over its surface without stirring. The reaction takes place little by little ; when it ceases, beat the mixture rapidly as possible so long as it retains its pasty consistence. It is absolutely necessary to prevent the mixture from becoming heated, because if the temperature rises quickly it is a certain sign that the citrate of magnesia has changed its molecular condition and become *insoluble*. For this reason it is safer to set the earthen dish in a vessel of cold water, and to spread out the citrate on the sides of the dish. When this manipulation is finished, the whole is allowed to repose during 24 hours, divided into masses and dried at a heat not exceeding 70° Fahr. It will be found that the chief secrets of success, are the employment of the smallest possible quantity of water, and to avoid the rise of temperature at the moment of combination, which is the result of a change of state of aggregation of the salt, and not to the reaction between the carbonate and citric acid.

Amianthus as a substitute for charpie or lint.—Dr. Dumont, of Montoux, has found that that form of asbestos called Amianthus may be employed as a dressing instead of scraped lint. This substance is soft, permeable, smooth to the touch and its in-

combustibility admits of its being used over and over again as it is purified by burning out the contaminating matter. Amianthus can be obtained in abundance in various parts of Europe, Asia, and the United States, and its fitness for this purpose is worthy of consideration in hospital practice.—*Union Méd.*

Antimoniate of Quinia in Intermittents.—Dr. La Camera, of Naples, in treating a solution of sulphate of quinia by a solution of antimoniate of potassa, has obtained a white product crystallized in needles, bitter to the taste, and soluble in hot water and in alcohol and ether. This antimoniate of quinia has given excellent results in periodical diseases, both simple and complicated with rheumatism, in sub-continued fevers of Torti, and in pernicious fevers. The dose is 0.4 grm. to 0.6 grm. during the apyrexia, and it is rarely necessary to be administered a second time.

On the adulteration of Saffron by the flowers of the Fuminella. By M. J. Leon Soubeiran.—The high price at which saffron is sold is a cause which induces the designing to falsify it, and already a number of articles have been used, such as the petals of calendula and arnica, cut, colored and oiled to give them suppleness, and those of *Carthamus tinctorius*, and not satisfied with these they have sought a new substance in the *Acafrao*, and more recently the flowers called *Fuminella*, from Brazil. In the early part of this year, M. Soubeiran noticed in the Paris drug market a saffron consisting of the stigmata of *Crocus sativus*, with a large proportion of *fuminella*. A very simple means of separating them is to take a large pinch of the adulterated saffron on a piece of paper, and give the latter a succession of taps beneath the saffron. The *fuminella* being smaller and heavier than the true saffron, falls to the bottom, on the paper, where it can be detected by its short fragments and its color, which has a rusty tint.

Their length varies from a fifth to two-fifths of an inch, according as they are broken or whole; are contorted after drying; appear ordinarily of equal width throughout their length, but, when whole, one extremity is more attenuated.

When these flowers are moistened, spread upon glass, and examined with a microscope, the characters of the corolla of *Synantheræ* are recognized.

The name of the plant yielding these flowers is not known, nor are they sufficiently perfect to enable the botanist to decide where to place them with certainty.

Oil of Erigeron.—Dr. Elwood Wilson, in the Transactions of the College of Physicians of Philadelphia, gives his experience with oil of *Erigeron Canadense* (not *Philadelphicum*) in five cases of uterine hemorrhage, in which it acted with marked efficiency. Dr. Benjamin H. Coates (in the same work) suggests an infusion of *Achillea millefolium*, (℥ss. herb to Oj. boiling water infused 20 minutes) as an excellent agent in the same kind of hemorrhage.

Onions in Epistaxis.—Dr. Benjamin Rorer, of Germantown, recommends (Hay's Journal for April) a paste made by bruising the inner portion of the common onion with an equal weight of flour and sufficient vinegar to form a stiff paste. This is applied by pressing it in the nostril from which the hemorrhage issues, until filled, and securing it with a bandage. This was found to act after alum, nutgall, and tincture of chloride of iron had failed.

Cod-Liver Oil with Quinia.—Mr. William Bastick, at a recent meeting of the Medical Society of London, described the mode of preparing a solution of quinia in cod-liver oil, which he has brought to the notice of the medical profession. Mr. B. prepares the solution (Pharm. Jour., March, 1855,) by heating, in a water bath a mixture of powdered *anhydrous* quinia and cod-liver oil, in the proportion of two grains to the fluid ounce. The oil acquires a darker color as the quinia dissolves. The quantity may be varied to suit the prescriber. The quinia is obtained in the condition proper for solution in the oil by precipitating a solution of sulphate of quinia with ammonia, washing the precipitate, drying it, and finally fusing it in a porcelain capsule by a regulated heat.

ON ALUMINIUM AND ITS CHEMICAL COMBINATIONS.

By M. H. SAINTE-CLAIRE DEVILLE.

It is known that Wöhler obtained aluminium in a pulverulent state by treating the chloride with potassium. By carefully conducting Wöhler's process, the decomposition of the chloride of aluminium may be so managed as to produce sufficient incandescence to render visible the agglomeration of the metal into glo-

bules. If the mass composed of the metal and of chloride of sodium (it is preferable to use sodium) be heated to bright redness in a porcelain crucible, the excess of chloride of aluminium will be driven off, and there will remain a saline mass having an acid reaction, in the midst of which will be found globules, varying in size, of perfectly pure aluminium.

This metal is as white as silver, and malleable and ductile in the highest degree. But when worked it appears to become harder, and its tenacity probably approaches nearly to that of iron. It may be hardened and again softened by annealing. Its density is 2.50. It may be melted and run out in the air without being sensibly oxidized. It is a good conductor of heat.

Aluminium is completely unalterable in dry or moist air. It does not become tarnished, and remains bright by the side of freshly cut zinc and tin while the latter lose their brilliancy. It is not acted upon by sulphuretted hydrogen. Cold water has no action upon it, and boiling water does not tarnish it. Nitric acid either diluted or concentrated, and diluted sulphuric acid, when applied cold, are also without action upon it. Its true solvent is hydrochloric acid, which evolves hydrogen and forms sesquichloride of aluminium. When heated to redness in hydrochloric acid gas, dry and volatile sesquichloride of aluminium is produced.

It will be seen that a white metal, unalterable like silver, which does not blacken when exposed to the air, which is fusible, malleable, ductile and tenacious, and which presents the remarkable property of being lighter than glass, may be rendered very useful if it could be easily obtained. When it is considered that this metal exists in considerable quantity in nature, its ore being clay, we can but wish that it may become common. I have every reason to believe that it may be so, for chloride of aluminium is decomposed with remarkable facility, at an elevated temperature, by the common metals, and a reaction of this sort, which I am now conducting on a larger scale than a mere laboratory operation, will decide the question in a practical point of view.—
Pharm. Journal, from Jour. de Pharmacie.

RESEARCHES ON THE CONSTITUTION OF QUININE.

BY ADOLPHUS STRECKER.

(Translated from the *Annalen d. Chem und Pharm.*, August, 1854.

By J. M. MAISCH.)

Concluded from page 246.

Iodide of ethyle-quinine. If iodide of ethyle is added to an alcoholic or ethereal solution of quinine, pale yellow needles are formed after a few hours. I have washed them with ether, and dissolved them in boiling water, from which, on cooling, they re-crystallize in thin needles, combined to semi-spherical masses. The crystals are colorless, of a silky lustre, very light and bitter, and without reaction on vegetable colors. They neither lose weight nor alter their form at 110° C.; at a higher temperature they melt without losing weight, but assuming a yellowish color, and solidify on cooling to a glassy mass; at a still higher heat they are decomposed. They are freely soluble in boiling, little in cool water, and also in alcohol, but not in ether. The iodine which they contain can be precipitated as iodide of silver by its nitrate.

For analysis I used crystals which had been dried at 100° C. The combustion was attempted with oxide of copper and oxygen, the first part of the tube containing a roll of sheet copper, the application of heat to it was interrupted as soon as the oxygen commenced to oxidize the reduced copper. Thus the iodine was not set free, but remained in combination with copper.

I. 0.3460 grms. crystals gave 0.6975 grms. carb. acid, 0.1930 gr. water.

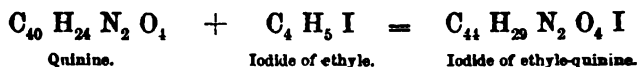
II. 0.2864 " " " 0.5760 " " " 0.1590 "

III. 0.4257 " " " 0.2080 " iodide of silver.

which lead to the formula $C_{44} H_{20} N_2 O_4 I$.

Calculated.			Found.		
			I.	II.	III.
44 C	264	55.0	55.0	54.8	—
29 H	29	6.0	6.2	6.2	—
2 N	28	5.8	—	—	—
4 O	32	6.7	—	—	—
1 I	127	26.5	—	—	26.4
	<hr/>	<hr/>			
	480	100.0			

The formation of this body may be exhibited by the following.



Iodide of methyle-quinine. An analogous combination may be had on adding iodide of methyle to an ethereal solution of quinine, when, after a while, crystals are deposited very similar to the former.

The crystals were dried at 110° C. before analysing them, when from 0.2412 grm. was obtained, 0.4792 grm. carbonic acid, 0.1285 grm. water, from 0.3624 grm. 0.1805 iodide of silver, which results agree with the formula $\text{C}_{42} \text{H}_{27} \text{N}_2 \text{O}_4 \text{I}$.

	Calculated.		Found.
42 C	252	54.1	54.2
27 H	27	5.8	5.9
2 N	28	—	—
4 O	32	—	—
1 I	127	27.8	26.9
	<hr/> 466		



A watery solution of iodide of methyle-quinine or ethyle-quinine is not precipitated by ammonia, like other salts of quinine; an addition of potassa at first leaves it clear, but after a large quantity has been added, a turbidness occurs, and a precipitate is formed which dissolves in water more readily when heated, and, on cooling, deposits crystals resembling the original iodides; which, indeed, have not been decomposed by potassa, but only precipitated, as they are insoluble in that liquid. The separation of iodine takes place without difficulty by oxide of silver, which, added to a solution of iodide of ethyle-quinine in water, forms yellow iodide of silver, and leaves the solution strongly alkaline. If oxide of silver is added until the formation of iodide of silver ceases, and the filtered solution is evaporated in vacuo above sulphuric acid, the residue is uncrystallizable and becomes hard and pulverable very slowly. It is easily soluble in water and alcohol; in the latter solution ether occasions a turbidness and separates a syrupy stratum which slowly deposits colorless needles. The aqueous solution of this base has a caustic and bitter taste, readily absorbs carbonic acid from the atmosphere,

and leaves, on being evaporated in contact with the air, a crystallized carbonate which has an alkaline reaction even after becoming saturated with carbonic acid.

This base, which I call *ethyle-quinine*, could not be obtained fit for analysis; in its amorphous state it dries with too much difficulty, and when I tried to dry it at 120° C., it generated the smell of chinolin and had other properties not existing before, being insoluble in water, and on analysis yielding products different from quinine and the supposed composition of ethyle-quinine. I found in this residue dried at 120° 72.6 per cent. carbon and 7.8 per cent. hydrogen, and must, therefore, reserve its analysis for a future time.

On acids being added to the aqueous solution of ethyle-quinine and then evaporated, it yields salts, most of which are crystallizable. Some of them I have prepared and analysed.

The aqueous solution mixed with sulphuric acid until the latter predominates, leaves, on evaporation in the water bath, a syrup on which absolute alcohol is to be poured to crystallize it. These crystals are little soluble in alcohol, and by washing them with it, may be freed from any adhering acid; they easily dissolve in water, but do not recrystallize after evaporation; their solution reacts acidulous, is not changed by ammonia, but when concentrated, precipitated by potassa, which precipitate is soluble in pure water. When dried over sulphuric acid, the crystals lose at 120° C., 8.2 per cent. water.

0.5995 grm. of these crystals, after desiccation at 120° , produced, with chloride of barium and hydrochloric acid, 0.3185 sulphate of barytes, equal to 18.2 per cent. sulphuric acid, which is in accordance with the formula $C_{44}H_{29}N_2O_5, SO_3 + HO SO_3 + 4HO$, demanding 17.8 per cent. sulphuric acid in the dry salt, and 7.4 per cent. water of crystallization.

Another sulphate is obtained when sulphate of silver is added to the watery solution of iodide of ethyle-quinine, until all the iodine is precipitated as iodide of silver. After filtration and due evaporation crystals are formed, which are much less soluble in water than the former, but readily so in alcohol. After being washed with water the crystals were used for analysis.

1.520 grm. air-dry crystals at 110° C. lost 0.224 grm. water, or 14.8 per cent.

0.6218 grm. of this anhydrous salt decomposed to 0.1880 grm. sulphate of barytes, corresponding with 10.1 per cent. sulphuric acid,

Its formula is therefore $C_{44} H_{29} N_2 O_6, SO_3 + 8HO$, which contains 10.0 per cent. sulphuric acid in the dry salt, and 15.2 per cent. water of crystallization.

Chloride of ethyle-quinine.—When hydrochloric acid is added to the solution of ethyle-quinine in water, and this evaporated in the air, a syrup results, in which, after a long time, thin needles are formed. But when a concentrated solution of chloride of sodium is added to ethyle-quinine, very soon needles are separated very much resembling those of the corresponding iodide. The best way to obtain them is to concentrate a solution of the nitrate (which does not crystallize, and is made by precipitating the iodide with nitrate of silver and filtering) and mix it with a concentrated solution of chloride of sodium. The needles are fine, combined to semi-spheroidal masses, which are to be recrystallized from boiling water; they are less soluble in cold water, neutral, and of the behaviour of the iodide. After being dried at $120^\circ C.$, from 0.4830 grm. was obtained 0.1785 grm. chloride of silver, or 9.1 per cent. chlorine, which corresponds with $C_{44} H_{29} N_2 O_4 Cl$, containing 9.1 per cent. chlorine.

The solution of ethyle-quinine mixed with hydrochloric acid, gives with chloride of platinum a yellow precipitate, soluble in boiling water, from which it crystallizes indistinctly.

0.3880 grm. of this double salt, when dried at 110° , yielded 0.0860 grm. platinum, or 25.4 per cent.

The formula $C_{44} H_{29} N_2 O_4 Cl + H Cl + 2Pt Cl_2$ demands 25.8 per cent.

The properties of ethyle-quinine and its combinations, show it to belong to that class of bases which are usually termed *ammonium bases*, sufficiently characterized by their strong alkaline properties, and the chlorides and iodides of which are not decomposable by potassa. The four equivalents of hydrogen of the ammonium are in these bases replaced by four organic radicals. Moreover, I have satisfied myself that ethyle-quinine does not contain another equivalent of hydrogen which might be replaced by ethyle; for a concentrated alcoholic solution of it does not

enter in combination on addition of iodide of ethyle, not even after some time.

If, accordingly, we may believe it to be demonstrated that ethyle-quinine is an ammonium base, the conclusion is irrefutable that quinine belongs to the *nitril bases*, or, in other words, quinine is a compound similar to ammonia, in which three organic radicals have taken the place of hydrogen. From this it follows further, that the formula $C_{40} H_{24} N_2 O_4$ represents the equivalent of quinine, inasmuch as it resembles one equivalent of ammonia. By the addition of one equivalent of iodide of ethyle the triethyleamin $Ae_3 N$ changes to iodide of tetraethyleamin $Ae_4 NI$, corresponding with the change of quinine to iodide of ethyle-quinine. Those bases that combine with one equivalent of iodide of ethyle must be equivalent, and, therefore, quinine as expressed by the formula $C_{40} H_{24} N_2 O_4$ is equivalent with $Ae_3 N$, and again this triethyleamin is equivalent with $H_3 N$. If the equivalent of quinine was $C_{30} H_{12} NO_2$, the iodide of ethyle quinine ought to be $C_{34} H_{17} NO_2 I$, which is contradicted by the analysis leading to the formula $C_{44} H_{29} N_2 O_4 I$.

Like quinine, ethyle-quinine combines with acids in two proportions, and these salts we can now designate as neutral and acidulous. The base of ethyle-quinine has probably in its free state the formula $C_{44} H_{29} N_2 O_5$, HO , and ought to be called the hydrated oxide of ethyle-quinine, for which, however, we prefer the abbreviation of ethyle-quinine.

In the same way we call the salts—

Neutral sulphate of ethyl-quinine	$C_{44} H_{29} N_2 O_5, SO_3$
Bisulphate of ethyle-quinine	$C_{44} H_{29} N_2 O_5, HO, 2SO_3$
Chloride of “	$C_{44} H_{29} N_2 O_4, Cl$
Iodide of “	$C_{44} H_{29} N_2 O_4, I$
Chloride of “ and platinum	$C_{44} H_{29} N_2 O_4, Cl+HCl+2Pt Cl_2$

We learn from the above that indeed organic bases may combine to form acid salts with hydrochloric acid, and such again with two equivalents of chloride of platinum. Most chemists, by believing the proportions of organic combinations to be identical with those of organic bodies, would not recognize other combinations of chloride of platinum, except with equal equiva-

lents, and I believe, in this case, I have proved first that other double salts of platinum exist.

The problem remains now to be solved, which are the three organic radicals contained in quinine. Although former experiments have thrown some light on this question, I decline now to enter into its discussion before further experiments have given us a stronger hold.

ON CIRCUMSTANCES MODIFYING THE ACTION OF CHEMICAL AFFINITY.

By J. H. GLADSTONE, Ph. D., F. R. S.

The question intended to be solved in this communication is,—what takes place when two binary compounds AB and CD are brought together under such circumstances that both they themselves and the products of their mutual action, remain free to react? Do they, according to a generally received opinion, remain unaltered, or, should the affinities so preponderate, become simply AB and CB? Or do A and C, according to Berthollet's view, divide themselves in certain proportions between B and D, the said proportions being determined not solely by the difference of energy in the affinities, but also by the difference of the quantities of the bodies? And, supposing the latter to be the correct view, do the amounts of AD and CB produced by the reaction, increase progressively with the relative increase of AB, or do sudden transitions occur, such as Bunsen and Debus have recently observed in certain cases where the products were removed at once from the field of action?

A reply was sought in the colors produced upon mixing different salts in aqueous solution. There were not many colored salts suitable for the purpose, as it generally happens that a base gives the same color with whatever acid it is combined, and *vice versa*; but the compounds of sesquioxide of iron were peculiarly adapted to the requirements of the experiment, as some are intensely colored, while others are nearly colorless.

The circumstances that attended the formation of the blood-red sulphocyanide were first fully examined. On mixing known quantities of different ferric salts with known quantities of different sulphocyanides, it was found that the whole of the iron

was never converted into the red salt; that the amount of it so converted depended on the nature both of the acid combined with the ferric oxide, and of the base combined with the sulphocyanogen; and that it mattered not how the bases and acids had been combined previous to their mixture, so long as the same quantities were brought together into solution. The effect of mass was fully tried by mixing equivalent proportions of ferric salts and sulphocyanides, and then adding known amounts of either one or the other compound. It was found that in either case the amount of red salt was increased; and that when the numbers of equivalents of the salt added were taken as abscissæ, and the amounts of red sulphocyanide produced, as ordinates, the numbers observed in the experiments gave regular curves, though not belonging to the second order. The curves representing the experiments in which sulphocyanide of potassium was mixed with ferric nitrate, chloride, or sulphate, appeared to be the same, but hydrosulphocyanic acid gave a different curve. The deepest color was given when nitrate of iron was mixed with the sulphocyanide, but even upon the admixture of one equivalent of the former with three of the latter, only 0.194 equiv. of the intensely red ferric salt was formed, and when 375 equivalents of sulphocyanide of potassium had been added, there was still a recognizable amount of nitrate of iron undecomposed. It was found that the addition of a colorless salt not only reduced the color of a solution of ferric sulphocyanide, but also that the reduction increased in a regularly progressive ratio according to the mass of the salt.

Other ferric salts were likewise examined. The black gallate gave results precisely analogous to those obtained by means of the sulphocyanide; the red meconate also confirmed Berthollet's views, but the action of mass was rendered obscure by the formation of double or of acid salts; the red pyromeconate resembled the meconate; the red acetate bore similar testimony; the blue solution of the ferric ferrocyanide in oxalic acid gave results fully corroborative of the influence both of the nature and of the mass of every substance present at the same time in the mixture; the purple and the red comenamate afforded similar results; while the red bromide (not the oxybromide,) though somewhat indistinct in its testimony, corroborated to a certain extent the preceding observations.

Experiments were performed with a view to determine what effect the mass of water might have on the salts operated upon; its influence in reducing the color of the ferric sulphocyanide was found to be very great, but the nature of it could not be exactly determined. As, however, it was uniform in its action in whatever manner the sulphocyanide had been produced, it could not affect the results of the preceding experiments. Water did not appear to act in any similar manner upon the other ferric salts.

From the mass of quantitative observations made during the investigation, it was possible to deduce not only the order of affinity of the various acids for sesquioxide of iron as compared with potash, but also to assign approximate numbers. Doubt may rest on the position of some terms in the series, but hydro-sulphocyanic acid certainly had the least affinity for ferric oxide in comparison with potash: it was represented by unity: the other acids followed in the order—nitric, 4; hydrochloric, 5; sulphuric, 7; gallic, 10; pyromeconic; meconic; acetic, 20; hydrobromic; comenamic; citric, 100; hydroferrocyanic 170.

Other colored salts were submitted to a more cursory investigation. The scarlet bromide of gold when treated with an alkaline chloride gave a striking instance of the effect of mass in gradually overcoming a strong affinity. The intensely red iodide of platinum afforded results which, though somewhat obscure, were not opposed in their testimony. So did the blue sulphate of copper when treated with different chlorides. The "manganoso-manganic oxide" dissolves in sulphuric or phosphoric acid of a red, and in other acids of a deep brown color; and it was found that hydrochloric acid was capable of changing the color of the sulphate according to its mass, while on the other hand, sulphuric or phosphoric acid altered in like manner the tint of the chloride. Somewhat similar results were obtained by means of the green chloride and the purple fluoride of molybdenum; and the blue solution that forms when gallic acid is brought in contact with both the oxides of iron at once, bore testimony to the same general laws. The peculiar optical character of certain salts of quinine was also taken advantage of for determining what changes took place among the compounds in solution. The amount of fluorescence exhibited by a solution of acid sulphate of quinine

was found to be affected by the admixture of a chloride, bromide, or iodide according to the nature and the mass of the salt added, and the addition of sulphuric, phosphoric, nitric and other acids was found to produce a fluorescence in solutions either of hydrochlorate of quinine, or of sulphate which had been rendered non-fluorescent by hydrochloric acid. Similar results were obtained with quinidine; and somewhat analogous ones with the organic bases contained in horse-chestnut bark, and in tincture of stramonium. An experiment is also narrated showing that the same laws hold good in respect to compound ethers as to salts having metallic bases, alcohol being employed as the solvent.

Besides the very diversified substances already mentioned in this abstract, several others, such as lead, mercury, zinc, potash, soda, baryta, lime and ammonia, are shown by a more indirect proof to enter into compounds which obey the same laws. Hence it is concluded that what was observed in reference to the ferric salts holds good very generally, if not universally.

The bearing of certain other phenomena upon the question at issue was also examined. The fact that precipitation, when it occurs, gives rise to a perfect interchange of bases and acids, is equally consistent with either Bergmann's or Berthollet's theory; but not so is the fact that two soluble salts cannot be mixed without the occurrence of precipitation, if one of the products that may be formed is an insoluble salt. The only recorded exception to this law, which occurs with oxalate of iron in the presence of a salt of yttria, under peculiar circumstances, was found on close examination to be in perfect accordance with the principles laid down by Berthollet. Besides the argument founded on this universal fact, several experiments were devised for the purpose of proving that the complete precipitation of an insoluble salt on the mixing of two soluble salts, was due to the insoluble compound being removed at once out of the field of action on the first distribution of the elements, thus necessitating a redivision, and so on until no more of it could possibly be formed. The phenomena attending volatilization have the same bearing as those connected with precipitation. If by the mutual action of two salts a substance be formed, which, though soluble in water, requires more water for its solution than is present, it crystallizes out; certain experiments were noted where this action occurs,

and it was found that they gave testimony in favor of the same views as have been supported by the preceding observations. The bearing of the phenomenon of diffusion of salts upon the point at issue was also examined; Malaguti's experiments were discussed; and they, as well as some observations on the solution of certain bodies by others set at liberty, were found to bear testimony also in the same direction.

During the whole of the experiments on this subject, most of which were performed quantitatively, no unequivocal instance occurred of two substances having so strong an affinity for one another, that they combined to the exclusion of other bodies of like kind present in the same solution. After showing that some reputed exceptions are not capable of being proved to be so, and after suggesting some probable limitations of the action of the general law, the paper concludes with the following deductions:—

I. That where two or more binary compounds are mixed under such circumstances that all the resulting compounds are free to act and react, each electro-positive element enters into combination with each electro-negative element in certain constant proportions.

II. That these proportions are independent of the manner in which the different elements were primarily arranged.

III. That these proportions are not merely the resultant of the various strengths of affinity of the several substances for each other, but are dependent also on the mass of each of the substances present in the mixture.

IV. That an alteration in the mass of any one of the binary compounds present alters the amount of every one of the other binary compounds, and that in a regular progressive ratio; sudden transitions only occurring where a substance is present which is capable of combining with another in more than one proportion.

V. That this equilibrium of affinities arranges itself in most cases in an inappreciable short space of time, but that in certain instances the elements do not attain their final state of combination for hours.

VI. That totally different phenomena present themselves where precipitation, volatilization, and perhaps other actions

occur, simply because one of the substances is thus removed from the field of action, and the equilibrium that was first established is thus destroyed.

VII. That consequently there is a fundamental error in all attempts to determine the relative strength of affinity by precipitation,—in all methods of quantitative analysis founded on the color of a solution in which colorless salts are also present,—and in all conclusions as to what substances exist in a solution, drawn from such empirical rules as, that “the strongest acid combines with the strongest base.”—*Chem. Gazette*, April 16, from *Proc. Royal Society*.

ON MANGOSTINE.

By Dr. W. SCHMID.

The mangostine tree (*Garcinia mangostana*), which is cultivated on the East Indian Islands, furnishes a fruit which is said to possess the most agreeable flavor of all tropical fruits. It is of the form of a berry and the size of an orange. Dr. Waitz, a surgeon in the Dutch East Indies, has employed the husk of the mango in fevers, and states that it is not only equal to bark, but even excels this when used in the fresh state. The author has accordingly examined these husks.

The husks used were dry, of a brownish-red color, thick and spongy, with an astringent taste, and contained internally a yellow, semicrystalline substance. They were finely powdered, and repeatedly extracted with water.

The watery solution contained for the most part a tannin, which produced a black color with iron. The residue was treated with hot alcohol, which completely dissolved the yellow crystalline matter. The fluid was filtered and left standing when a yellow amorphous mass separated on evaporation; this contained the body to which the author gives the name of *mangostine*, mixed with resin. The latter is very difficult of separation; the best method is to heat the filtered alcoholic solution to boiling, and add distilled water in small quantities until the fluid becomes opalescent. The resin, which is but sparingly soluble in cold dilute alcohol, is deposited on cooling; the mangostine does not separate until long afterwards, when it takes the form of small,

yellow, silky laminæ; so that by pouring the fluid from the deposit of resin, the mangostine may be obtained tolerably pure. To purify it further, it is dissolved in alcohol, and precipitated with basic acetate of lead. The precipitate is well washed, suspended in alcohol, and decomposed whilst hot by sulphuretted hydrogen. The filtered solution is then mixed with water whilst boiling until it becomes milky, as the mangostine only crystallizes from a dilute alcoholic solution. The complete purification of the substance is completed by repeated crystallization from alcohol.

Mangostine crystallizes in thin laminæ, of a fine golden lustre; it is tasteless and inodorous; melts at about 374° F. without loss of water, forming a thick, transparent, deep yellow fluid, which solidifies on cooling into a brittle, amorphous, transparent mass; it is heavier than water. When heated above its melting-point, it is for the most part decomposed, but a part sublimes unchanged. It burns on platinum foil without residue. It is soluble in water, but dissolves readily in alcohol and ether. The solutions have no reaction on litmus-paper.

Dilute acids dissolve the greater part of it with the aid of a moderate heat, and deposit it again unchanged on cooling. Concentrated nitric acid converts it into oxalic acid at an elevated temperature. Cold concentrated sulphuric acid dissolves it with partial decomposition, and with a dark yellowish-red color; when heated, carbonization commences. It dissolves in alkalis with a yellow or brownish color. It is not precipitated by metallic salts, with the exception of basic acetate of lead. It reduces the oxides of the noble metals. With chloride of iron it produces a greenish-black color, which disappears on the addition of acids. Analysis led to the formula $C^{40} H^{22} O^{10}$:—

	I.	II.	III.			
Carbon	69.64	69.63	69.74	40	3000	70.17
Hydrogen	6.66	6.37	6.44	22	275	6.43
Oxygen	23.70	24.00	23.82	10	1000	23.40

For the preparation of the compound of mangostine and oxide of lead, the substance was dissolved in alcohol, and then treated with an alcoholic solution of neutral acetate of lead, in such a manner that all the mangostine was not precipitated by the addition of a small quantity of ammonia. The precipitate thus

produced was gelatinous, yellow, insoluble in water, slightly soluble in alcohol, and decomposable by acids. When dried at 212° F., it could be pounded into a light yellowish-green powder, which when heated burnt away quietly without scintillation. Analysis led to the formula $2(C^{40}H^{22}O^{10}) + 5PbO + HO$:—

	Found.			Calculated.
Carbon,	38.67	80	6000	38.87
Hydrogen,	3.45	45	562.5	3.59
Oxygen,	13.74	21	2100	13.46
Oxide of lead,	44.14	5	6972.5	44.58

This lead compound is not always of the same composition, for in two analyses of a compound prepared at another time the author obtained 37.85 and 37.46 per cent. of oxide of lead.

Several other bodies, obtained from plants of the same natural family (*Guttiferæ*) as the *Garcinia mangostana*, appear to possess a certain relation with mangostine, both in regard to their formulæ and chemical properties.

According to Johnston, gamboge obtained from *Garcinia gutta* has the formula $C^{40}H^{18}O^{21}$. From this it appeared probable that mangostine might be obtained by the oxidation of gamboge. The author accordingly treated the latter substance with hot concentrated nitric acid, and obtained a crystalline body which appeared to possess reactions exactly analogous to those of mangostine.

Indian yellow (purree), which is said to be obtained from the deposite of camel's urine after the animals have eaten the fruit of *Mangostana magnifer*, consists principally of euxanthate of magnesia; the acid of this salt has the formula $C^{40}H^{16}O^{21}$. Hence it appears possible that both mangostine and gamboge may be converted into euxanthic acid by passing through living bodies.

From this the author was induced to make some experiments with euxanthic acid, from which it appeared that this acid is a conjugate compound. Thus if it be treated with concentrated nitric acid, and the fluid be poured into water, euxanthone separates. The fluid filtered from this substance has the property of reducing peroxide of copper dissolved in potash, a power possessed neither by euxanthic acid nor by euxanthone.—*London Chem. Gaz. from Liebig's Annalen*, xciii. p. 83.

ON URSONE, A NEW SUBSTANCE FROM THE LEAVES OF
ARCTOSTAPHYLOS UVA URSI.

By H. TROMMSDORFF.

The author has prepared a new crystallizable substance from this plant, to which he gives the name *ursone*. An alcoholic extract of the leaves was made, the watery solution of which was employed in the preparation of arbutine according to Kawalier's method. The green residue remaining after the solution of the extract in water was repeatedly washed with ether, then decocted with alcohol, and the alcoholic fluid filtered whilst boiling. On cooling, it deposited a substance in fine crystals.

This substance is most easily obtained by exhausting the coarsely powdered leaves of the plant with about an equal weight of ether, in Mohr's apparatus for extraction with ether. An abundant deposit of crystalline powder is found in the dark green ethereal extract; this is washed with ether and recrystallized from alcohol.

The substance forms fine, colorless, silky, acicular crystals; it is tasteless and inodorous, insoluble in water, dilute acids and alkalies, and difficult of solution in alcohol and ether. It fuses by heat into a colorless liquid, which solidifies on cooling, forming a transparent, amorphous, cracked mass. At a higher temperature it boils and volatilizes, apparently unchanged, forming a white sublimate on the cold side of the vessel. In contact with the air, it burns completely, with a yellow smoky flame, without leaving any cinder. Concentrated solution of potash appears to have no action upon it either when hot or cold. Concentrated sulphuric acid gives it an orange-yellow color, without dissolving it completely, although the liquid also assumes this color; when heated, the color passes to brown, and at last carbonization takes place with evolution of sulphurous acid. Fuming nitric acid dissolves the substance with a slight evolution of nitrous acid, forming a clear yellow fluid, from which a white body is deposited in abundance on the addition of water.—*Ibid.* from *Archiv der Pharm.*, lxxx. p. 274.

THE QUICKSILVER MINES OF OLD AND NEW ALMADEN.

Quicksilver or mercury has been known from the earliest ages, but is found nowhere in such large quantities as in Spain and California. Almaden, in Spain, has long been famed for its mines of this metal, which, according to Bowles, are the richest in their produce, the most instructive as to the mode of working them, the most curious for their natural history, and the most ancient in the world. We find them mentioned in Theophrastus, 300 years before Christ, and Vitruvius also speaks of them. Pliny places Cisapona, or, as it is sometimes written, Sisapona, in Boetica, and says that this mine was kept sealed with the greatest care, and was only opened to take the quantity of cinnabar necessary for the consumption of Rome. (*Nat. Hist.*, xxiii., 7.) The Romans considered this mineral poisonous; but notwithstanding this, their matrons painted their faces with it, and their painters employed it as a pigment. The Romans certainly worked this mine, but no traces remain of their labors. The Moors, owing perhaps to some prejudice, did not work it.

In the *Introduction à la Geografica Fisica y la Historia Natural de Espana*, we read that "the country about Almaden abounds in iron mines; and what is more surprising, in the same mine we find iron, mercury and sulphur mixed, so as to form one mass. The neighboring hills are formed of the same stone, and on all of them the same plants grow; from which we may infer that the mercury does not possess any poisonous quality, as is generally supposed, injurious to vegetation.

"The brothers Mark and Christopher Függer, of Germany, undertook to work this mine, and contracted to give the government 4500 quintals of mercury annually; but not being able to fulfil their promise, they abandoned it in 1635, together with the silver mine of Gualcanal, which they also had. While connected with those mines, however, their riches became proverbial in Spain, and their descendants live at present in Germany, with the rank of princes. A branch of this family afterwards took the mine, and worked it till 1645. In the following year the government undertook the management of it. Don Juan Bustamento established the furnaces, and also troughs for cooling the metal. These furnaces are twelve in number, and are called by the names

of the twelve apostles. Each is capable of containing ten tons weight of ore. The furnace is kept burning for three days, and the same period is required for cooling."

Mr. Russell Bartlett, the United States Commissioner on the Mexican and United States Boundary Question, who visited California in 1853, gives the following account of the New Almaden Mine:—

"New Almaden consists exclusively of the buildings belonging to the company which owns the quicksilver mine. It embraces furnaces, storehouses, dwelling-houses for the officers and laborers, offices, mechanics' shops, &c. Many of them are of wood, but a large and fine range of substantial brick buildings is now in the process of erection, to take the place of the wooden ones. The novelty of the business of extracting the quicksilver from the cinnabar required a number of experiments, involving a very heavy expenditure; for there were few mines in the world where the operation was carried on on a large scale, and it could not be expected that a rival company like this, whose operations would effectually interfere with the trade the latter had for ages enjoyed, would be permitted to derive any information from their long experience. Machinery of various kinds was therefore imported from England and the United States at enormous cost, much of which has since been rejected, either on account of the great expense of running it, or its inadequacy to perform the service required. Six furnaces are now in operation reducing the ore, all of which seem to be alike, and of the most simple construction. The ore, when brought from the mine and deposited near the furnaces, is separated according to its quality. The larger masses are first broken up, and then all is piled up under sheds near the furnace doors. The ore is next heaped on the furnaces, and a steady, though not very strong fire is then applied. As the ore becomes heated the quicksilver is sublimed, and then being conducted by pipes which lead along the bottom of the furnace to small pots or reservoirs imbedded in the earth, each containing from one to two gallons of the metal. The furnaces are kept going night and day, while large drops or minute streams of the pure metal are constantly trickling down into the receivers. From these it is carried to the store-house, and deposited in large cast-iron tanks or vats. These are of various shapes and sizes, and are fixed in solid beds of stone and mortar. The

largest, a square vat between four and five feet across, contained twenty tons of pure quicksilver. Seven or eight days are required to fill the furnaces, extract the quicksilver, and remove the residuum, the latter being the most dangerous part of the process. All is done as much in the open air as possible, the furnaces being merely protected by a roof.

"In the warehouse, the metal is prepared for the market. This is done by putting it into wrought iron flasks or bottles, holding about seventy-five pounds each. The quicksilver is dipped up with ladles, and poured into the bottles through an ordinary tin funnel. The opening or neck of the bottle is then stopped with a close-fitting screw, put in with a vice, so as to make it as tight as possible. These bottles, which weigh twenty-five pounds each, are all made in England, where they can be furnished much cheaper than in the United States. From the warehouse the metal is transported by ox-carts to tide-water about twenty miles distant, whence they are shipped to San Francisco. A shipment of a thousand bottles was lately made to Canton, by way of an experiment. In China it is chiefly used in the manufacture of vermilion and other articles of commerce. The quantity of quicksilver produced at New Almaden is about 1000 bottles per month, or nearly 1,000,000 lbs. per annum.

"The mine whence the cinnabar is obtained contains veins of ore extending in every direction, sometimes horizontal, then perpendicular, and again at every inclination. Their whole extent now exceeds 7000 feet. When a vein is struck, it is followed as far as it can be with safety, whatever may be its course. Some of the veins are five feet in diameter, others half that size. Some are also richer than others. In each of the veins is a single miner, for not more than one can work to advantage in these narrow recesses. Picks, drills, and crowbars are the tools employed.

"The miners, and those who merely handle the cinnabar, are not injured thereby; but those who work about the furnaces, and inhale the fumes of the metal are seriously affected. Salivation is common, and the attendants on the furnaces are compelled to desist from their labor every three or four weeks. When a fresh set of hands is put on. The horses and mules are also salivated, and from twenty to thirty die every year from the effects of the mercury.

"This mine was long known to the Indians, who resorted hither for the vermilion, which they could collect from the cinabar. They had dug some thirty or forty feet into the mountain; but it does not appear ever to have been worked by the Spaniards. In recent times its commercial value was first discovered by Senor Castellero, who became its legal owner. Don José Castro, who subsequently became proprietor of it, sold his interest to Barron & Forbes, an English house doing business in Mexico. Another partner is Mr. Walkinshaw, an English gentleman, long resident in Mexico, and well skilled in mining. This gentleman now resides at New Almaden. Mr. Young is the superintendent of the mine, and Mr. Beston is the engineer.

"During the year 1853, the total exports of quicksilver from San Francisco amounted to 1,350,000 lbs., valued at 683,189 dollars. All this, together with the large amount used in California was the product of the New Almaden mine. The following shows to what points the quicksilver was exported:—Hong Kong, 423,150 lbs.; Shanghae, 60,900 lbs.; Canton, 27,450 lbs.; Whampoa, 22,500 lbs.; Calcutta, 3,750 lbs.; Mazatlan, 210,825 lbs.; Mazatlan and San Blas, 19,125 lbs.; San Blas, 145,652 lbs.; Callao, 135,000 lbs.; Valparaiso, 148,275 lbs.; New York, 138,375 lbs.; Philadelphia, 75,000 lbs.—*London Pharm. Journal*, 1855.

ON THE FRANKINCENSE TREE OF WESTERN AFRICA. (DANIELLIA THURIFERA, BENNETT.)

By W. F. DANIELL, M.D., F.L.S.,

Honorary Member of the Pharmaceutical Society.

The tree that furnishes the product termed African Frankincense, though of plentiful growth in the peninsula of Sierra Leone and circumjacent regions, appears hitherto to have escaped the attention of the voyagers and travellers who for so many centuries visited this part of the coast. The knowledge, therefore, with reference to its existence, can only be limited to a comparatively recent period, or within the present century. No mention has been made of this substance in the works of either Afzelius or Winterbottom, and all the information to be obtained is a traditional rumor that vaguely ascribes the discovery of its

odoriferous qualities to one of those enterprising Jesuit missionaries who visited Africa during the sixteenth century. This personage carried with him to Europe, on his return, a small sample of this gum, and so highly were its fragrant properties appreciated, when used in lieu of the ordinary incense, that this production would have become a valuable commercial export, had not the premature death of the priest, from the debilitating effects of climate, rendered abortive all attempts to ascertain the source from whence he had derived his supply.

The negro communities of tropical Africa, especially the female portion, have from a primitive age been in the habit of selecting several fragrant and aromatic gums, woods, roots, and leaves, with a variety of other substances from the vegetable kingdom, as articles of perfumery, to remove the disagreeable fœtor of the skin, and sometimes for the celebration of their religious and funeral rites, or with the object of adapting them to medical purposes. It is probable that under the authority of these sacerdotal customs, the *Bdellium* (*Heudolatia Africana*, Rich.), Copal, and the produce of other gummiferous trees, have attained a greater degree of importance among some nations than others, on account of their more exclusive appropriation to such ceremonies, and from the agreeable odor diffused by their combustion. On the other hand, the *Cyperus odoratus*, Lin. (?); *Ricinus Africanus*, Willd.; *Bassia Parkia*, R. Br.; *Arachis hypogæa*, Willd.; *Tuculla*, a species of Redwood; *Sesamum orientale*, Willd.; *Pentadesma Butyracea*, Don.; *Carapa Touloucouna*, Rich.; *Citrus Limetta* and *Aurantium*, Risso; *Daniellia Thurifera*, Btt.; *Elais Guineensis*, Willd.; and *E. melanococca*, Gært., and other sweet-scented roots and plants, are more generally devoted to personal appliances, and are proportionately esteemed, for their prophylactic efficacy in some cutaneous maladies.

The Frankincense tree grows to a large size, and may be distinguished without difficulty, by the erect and stately trunk and beautiful foliage. When of advanced age, its recognition is rendered still more certain by the peculiar grey or ash-like color of the bark, and massive divergent branches, which expand into a mass of foliage at an altitude of fifty or sixty feet from the ground, to a considerable distance around.

The mountainous districts to the westward of Freetown, and

the wooded slopes in the neighborhood of York, Lumley, and Goderich villages, are the localities in which it principally abounds, although it has been observed on the banks of the Sherbro and other adjoining rivers. If any credit can be attached to the assertions of several Ako' colonists, the same production has been met with on the forest declivities of Fernando Po, and is stated to be equally common in Yorruha, where it is known by the appellation of *Ogea* or *Ojeah*. This plant would therefore appear to be indigenous to various countries of the African continent, could any reliance be placed upon these reports; they cannot, however, be received with implicit credence, and until subsequent observations verify their correctness, must continue to be of doubtful value.

In Sierra Leone, the Timmané or Soosu designation of *Bungbo*, usually pronounced *Bungo*,* under which the gum is sold by the native traders, has also been conferred on the tree producing it, and hence the source of the term Bungo tree. A few of the more remarkable botanical characteristics of this production demand a brief notice. During the early years of growth, the young plant has the bark of a deep brown, which changes gradually in color as it enlarges in magnitude. When of moderate size, the entire circumference of the trunk is studded by a series of horizontal excrescences, or oblong elevations in the cortical covering, of a pale or yellowish-brown hue, appearing in dense parallel but disconnected strata, a quarter of an inch or more apart, and varying from one-sixth to one inch in length, and about one or two lines in breadth. Being of a lighter tint than the surrounding portions, they are distinctly perceptible, and answer as a diagnostic peculiarity to identify the lesser shoots. As the tree approaches maturity, these elevated projections proportionately diminish, and the cortex, while partially retaining its smoothness, becomes traced by irregular patches of white or grey. In the course of time, these patches enlarge to that extent as to embrace in many instances the entire surface of the exterior. The inner cortical layers in plants of an immature development present a peculiar fibrous character, are delicately organized, and

* "The fragrant gum called Bungo is the principal material one mason here uses for his dwelling."—*A Residence in Sierra Leone*, p. 218, Ed by Mrs. Norton.

may be peeled off in smooth ribbon-like layers, which cannot be effected in the older specimens.

The gum, when of a natural exudation, mostly appears in a liquid state, of a white or pale straw color, in some seasons oozing so copiously from the branches, that the ground and shrubs beneath are, from successive excretions, thickly covered with white spots. This effusion, however, does not occur so abundantly from the cortex, and when so produced, appear in thin and shallow layers, that mark their course by whitish streaks, that after their exsiccation on the trunk, present all the aspects of a saline efflorescence. The gum while in this state of fluidity cannot be collected for ordinary use. The substance offered for sale is widely different, from the effect of certain indirect agencies, tending to considerably modify both its qualities and secretion.

The Frankincense tree is subject to the attack of a certain insect, termed by the natives *Tumbo*, which deeply perforates the bark in various directions. Its progress is attended by long and sinuous passages, the woody *debris* from which is ejected externally by a circular orifice about an inch in diameter. In the course of a few days, the gummy liquid issues largely from this aperture, blended with minute ligneous particles, which in their transit through these excavations, acquire a ruddy or brown tint, by degrees accumulating in small masses, and falling to the earth. In this state they become converted into dark brown fragments after a short interval, and are then gathered by the negro women and children, who resort to the woods with the express purpose of collecting them. Another mode of procuring this gum consists in stripping the dead or unsound bark from the wood, the more decayed portions of which are commonly saturated by the gummy exudation, and are found amalgamated with the woody fibre beneath in black crusts.

Great uncertainty prevails with reference to the period at which this tree flowers. Several colonists remark that they have not hitherto been seen, and the majority appear to be as equally ignorant on the subject. I observed the pod, however, was in a green condition early in March, from whence we may infer that the flowering probably commenced in December or January. The fruit is a coriaceous, thin, and dehiscent legume, from two to two and-a-half inches long, and one to one-and-a-half in

wide, of an irregular ovate or semilunar shape, when ripe of a pale yellow color, and bursting into four segments, two inner and two outer, previous to their fall from the branches. Between the suture of the two former is embodied a solitary, flat, ovate-oblong, and chocolate-colored seed, which usually detaches itself from the sutures as they expand, and is suspended by a firm, funicular attachment to the inner surface of one of the external segments. The leaves are bipinnate, of a pale green, pervaded by a greyish tint, that also characterises the trunk. In the younger productions they are of larger development, but the pinnæ are less numerous than in those of a later growth. It is unnecessary for me to enter into any further botanical details, after the able delineation of the plant by Mr. Bennett in the *Pharmaceutical Journal* for last November.

Two kinds of frankincense, brought from the circumjacent villages, may be found in the market of Freetown, both of which are evidently the produce of the same tree. The first can be partly recognized by the dark brown, or black shining and irregular fragments, from apparently having a larger amount of gum blended with the woody fibre than the other, which is met with in smaller and less compact pieces, more friable, and of a lighter brown or yellow tint, being chiefly constituted of manifold white, woody particles, cemented into masses by the excreted gum. Of these two varieties the latter is the least valued. They are, nevertheless, usually found intermixed in the samples offered for purchase.

The incense-like fragrance peculiar to these woody-resinous excretions, renders them available for a variety of uses. Occasionally they are had recourse to for the fumigation of houses in cases of sickness, but their ordinary appliance in the Sierra Leone districts, is that of a perfume among the native females. With this view they triturate the gum with lime manufactured from sea-shells, between two purposely adapted stones, and after their reduction into a fine powder, rub their bodies with it.

The bark, though endowed with similar odoriferous properties to a limited degree, is seldom or never resorted to for any personal or domestic employment. The ignition of the gum is rapid: a bright yellow flame, attended with a black or carbonaceous smoke, resulting. This is followed by the deposition of a

viscid oleaginous matter, and the evolution of a remarkable aromatic and semi-resinous odor, approximating to that produced from the common pastiles, for which they would form not an inappropriate substitute, either in the sick chamber, or on such occasions where an agreeable impregnation of the atmosphere was required.—*Pharmaceutical Journal*, March, 1855.

ON THE ADVANTAGES OF THE TWADDLE'S AREOMETER OVER
THOSE OF BEAUME AND BECK.

By Dr. BOLLEY.

It appears very desirable to call the attention of chemists to Twaddle's areometer, not merely because the specific gravities of fluids heavier than water are always expressed in accordance with this instrument in the copious technical literature of England, but also because this areometer has great advantages over those in use on the continent, and deserves to take their place. In all the chemical factories of England which the writer had an opportunity of visiting, he became convinced that Twaddle's areometer fully deserved the estimation in which it is held by German and French manufacturing chemists who visit England, even though previously accustomed to Beaumé's

The advantages of this instrument are,—1st, that for the distinction of the specific gravities between 1.000 and 2.000, it contains 200 degrees, so that it indicates much smaller differences in the density of fluids than Beaumé's areometer, which has only 76 degrees between 1.000 and 2.000 spec. grav. One bad result of such a more exact division would be the necessity of employing a very long scale, or having very small degrees; but both these disadvantages are to a certain extent avoided by making the entire apparatus consist of six areometers, of which the first ranges from 0° to 26°, the second from 24° to 60°, and so forth. The whole scale of degrees thus reaches a length of about 26 inches.

2. Each degree represents a *constant progression* of the specific gravity, so that, supposing we know the very simple principle of the division, on reading off the degree we immediately obtain the corresponding density of the fluids. The principle of this division is as follows:—The specific gravity of water being set at 1.000,

every increase of density equal to 5 unities is represented by, degree; thus—

1° Twaddle	=1.005
2°	=1.010
7°	=1.085

The degree has consequently only to be multiplied by 5, and the number thus obtained added to 1.000, and we obtain the specific gravity of the fluid under examination.

Hence it follows that this areometer is one with a *rational* scale and a further consequence is that the degrees must be of *unequal* length.

That the employment of this instrument would essentially simplify some calculations is evident from the following:—

1. A gallon (English) of distilled water weighs 10 lbs. (English). By sinking Twaddle's instrument into a solution, an acid, &c., and multiplying the degree obtained by 5, we readily learn the weight of a gallon of the latter fluid. For instance, an acid of 50° Twaddle has the spec. grav. 1.250, and the gallon consequently weighs 12½ lbs.; the gallon of another of 5° Twaddle weighs only 10½ lbs.

2. With French measures and weights, the matter becomes still more simple; 1 litre of distilled water weighs 1000 grms; 1 litre of a fluid, say of 20° Twaddle, therefore weighs 1100 grms., i. e. $1000 + 20 \times 5$ grms.

3. If an acid or solution of a given degree is to be diluted to a lower strength, how much water must be employed. For instance, sulphuric acid of 170° Twaddle is to be diluted to 6°. The proportion for dilution is obtained by the division of 170 by 6; the quotient is 28.333; that is to say, when 1 litre of acid of 170° Twaddle is diluted to 28.333 litres, or in other words when 27.333 litres of water are added to it, we obtain a fluid of 6° Twaddle, for 170° Twaddle represents the spec. grav. 1.850 and 6° Twaddle, the spec. grav. 1.030, consequently the 28.333 litres contain 27.333 litres of water, 1 litre of sulphuric acid weighing 1.850 grm.; the weight of the whole is $27.333 + 1.850$ grm. = 29.183 grms.; hence, by dividing the total weight, 29.183 grms., by the volume, 28.333 litres, we obtain the spec. grav. 1.030.

If it were desired to perform a similar calculation with the

areometer of Beaumé or Beck, considerable errors would be induced.

From this it may readily be seen, that from an observation with Twaddle's areometer certain sound conclusions as to the nature of the fluid may be deduced; whilst Beaumé or Beck's instruments not only give imperfect and arbitrary results, but their indications do not stand in connexion with the nature of the substance under investigation.—*London Chem. Gaz.* Jan. 1, 1855, from *Schweiz. Gewerbebl.*

ON THE BEHAVIOR OF PALM-OIL WHEN HEATED.

By DR. J. J. POHL.

The melting-points of palm-oil, as observed by different chemists, present great discrepancies. This would lead at once to the conclusion, that the oil has not always the same constitution, a supposition which acquires still greater probability from the circumstance that the oil is obtained from the fruits of various palms, such as *Avoira elais*, and species of *Areca* and *Cocos*.

The author has determined a series of melting-points. Oil from various merchants and of different age, exhibited very different melting-points. One sample (A), $94^{\circ}\cdot 8$ – $95^{\circ}\cdot 2$ F.; another (B) on an average, $94^{\circ}\cdot 1$ F.; and a third, (C) $76^{\circ}\cdot 5$ – $76^{\circ}\cdot 9$ F. Very old palm oil, which had been kept at least two years, melted at $105^{\circ}\cdot 8$ – $106^{\circ}\cdot 16$ F.

The oil A, kept melted a considerable time in contact with the air at 190° – 199° F., exhibited a melting-point of $99^{\circ}\cdot 5$ F. The fat, purified by filtration whilst hot, was then exposed to a higher temperature. At 239° F. the fat employed began apparently to boil, probably in consequence of the evaporation of a small quantity of water which it might contain; this ceased at $368^{\circ}\cdot 6$ F. But even at 294° F., very acid, pungent white vapors began to be formed (exhibiting no resemblance in odor to acroleine); these became very troublesome at 374° F., although the weight of the substance thus volatilized was inconsiderable. At $474^{\circ}\cdot 8$ F., boiling did not take place. The palm-oil then had a dark-brown appearance; but a portion of it, poured into cold water to cool it rapidly, no longer showed any trace of the yellowish-red color;

the palm oil was bleached in this manner; and although still somewhat brownish, was quite as white as the best palm oil bleached according to Payen's method. It had the consistence of hog's lard, an empyreumatic odor, the peculiar odor of palm-oil having entirely disappeared, and a wax-like taste. The portion of the heated palm-oil which had not been poured into water was still fluid after standing two hours at $72^{\circ}5$ F., and the separation of a solid body only commenced in three hours. After nineteen hours, a third part was still fluid, and a brownish-red oil flowed spontaneously from the fatty mass, amounting to about one twenty-fifth of the whole. In the course of sixty hours, even this oil solidified into a brownish-white mass. The bleaching of palm-oil therefore takes place under the above circumstances in a short time, as completely as by Payen's process in ten or twelve hours.

It was now to be ascertained whether the access of light and air was necessary for the bleaching; and to settle this point, palm-oil was heated in a covered vessel, and in the dark, to 475° F., and left to cool after exposure to this temperature for ten minutes. The palm-oil was, as before, completely bleached. At this high temperature, therefore, the destruction of the yellowish-red coloring matter is not affected either by the action of light, or by oxidation at the expense of the atmospheric oxygen.

To find the lowest temperature at which this rapid bleaching can be advantageously effected, palm-oil was heated in twenty-four minutes to 410° F., and kept at this temperature for six minutes; on cooling it was certainly lighter in color, but not perfectly bleached. Heated in fifteen minutes to 419° F., and kept in this temperature for fifteen minutes more, the palm oil was lighter in color than in the preceding case, but still not sufficiently bleached. When kept at $469^{\circ}4$ F. for fifteen minutes, it appeared completely decolorized. Lastly, when palm oil was heated in twelve minutes to 464° F., a sample drawn at once still retained a yellow color; but in five minutes it was colorless. From the above experiments it appears that when palm-oil is quickly heated to 464° F., and kept for a few minutes at this temperature, it is perfectly bleached without access of air or light. The author has not only tried this mode of bleaching on a large scale, but it has been carried out for three years in a manufactory. The heating of the palm-oil is effected as rapidly as possible in cast-iron pans; it is

kept for ten minutes at a temperature of 464° F., and the bleaching is then completed. Ten or twelve hundredweights of palm-oil may be conveniently heated in one pan, which must, however, only be two-thirds filled, as the palm-oil expands greatly by the heat. It must be covered with a well-fitted cover, which prevents inconvenience from the above mentioned acid fumes. The palm-oil acquires a purer white color when operated upon on a large scale, than when treated in small quantities; it furnishes a very fine, solid white soap. The empyreumatic odor which occurs immediately after the bleaching, is lost after some time, and the original violet-like odor of the palm-oil again returns. The soap prepared from it has also a pleasant violet-like odor, as the empyreumatic smell entirely disappears during saponification. Palm-oil which is much contaminated with vegetable matters should be melted at a lower temperature before bleaching, so as to allow the impurities to settle. The best samples of palm-oil never contain more than from 0.3 to 1.0 per cent. of such impurities.

If palm-oil be heated to 572° F. with access of air, it begins to boil, and a strong odor of acroleine is perceptible. Distillation, carried on at 572° – 592° F., proceeds very slowly, as the vapors formed are heavy and readily condensable; but if ordinary steam be allowed to flow into the fatty mass heated to 572° F., the distillation takes place very quickly. At the commencement of boiling the palm-oil froths much, and easily passes over into the receiver; but in a few minutes this frothing ceases, and the distillation goes on without further disturbance.

The author has effected the distillation of quantities of from 30 to 50 pounds of palm-oil. If the fat be in contact with atmospheric air at the point of distillation, acroleine is formed with the mixture of fatty acids which passes over. The action of this substance on the lachrymal glands and the organs of smell and respiration is terrible. The same odor is acquired under these circumstances by the products of distillation, and they cannot be freed from it even by boiling with water. But if care be taken that, when palm-oil has reached the temperature of 572° F., all atmospheric air shall have been expelled from the apparatus by steam, not the smallest odor of acroleine makes its appearance during the distillation, which takes place without any trouble to the workman. At the end of the operation, a blackish-brown fluid remains in the distilling vessel, which on cooling sets into a tough and

elastic mass, and may be employed as an ingredient in the production of common soap, in the preparation of engine-grease, &c.

From the crude palm-oil purified by fusion, from 68 to 74.6 per cent, of fatty acids were obtained by distillation. The color and consistence of the distillate is not the same at different periods of the operation. At first from 25 to 30 per cent. of perfectly colorless fatty acids come over rapidly; these, when solidified, form a solid mass; after this, the products of distillation pass more slowly, always becoming more greasy on cooling, and more and more of a brownish color. The empyreumatic odor of the fatty acid is lost in time, giving place to a waxy odor. If the colorless product of distillation be kept in a fused state for a considerable time, even at a low temperature, or repeatedly fused, it gradually acquires a darker color, and at the same time becomes softer.

Determinations of the melting points of the fatty acids obtained by distillation gave the following results:—

First Experiment.—The first half of the distilled fatty acids, which was of a slightly yellowish-white color, was,—I. transparent at 105° F., and melted at 117°·5 F.; II. transparent at 104° F., and melted at 117°·5 F.

The second half of the distillate, of a strong brownish-white color, was,—I. transparent at 101°·3 F., melted at 110°·7 F.; II. transparent at 107°·8 F., melted at 110°·9 F.

The second half of the distillate, after complete cold pressure, fusion with water to which 0·25 per cent. of oxalic acid had been added, and fining with white of egg, had a slightly brownish-white color; it was,—I. transparent at 107°·4 F., fused at 121°·5 F.; II. transparent at 101°·7 F.; fused at 120°·7 F.

II. is a mere repetition of the determination of the melting-point of the mass serving for the first experiment (I).

Second Experiment.—The products of distillation were collected in five separate portions. The percentage proportions, compared with the entire distillate, were for the first portion 1·21 per cent., 2·28 per cent., 3·17 per cent., 4·9 per cent., 5·25 per cent.

The determinations of the melting-points gave the following results:—Portion 1, transparent at 111°·9 F., fused at 124°·5; 2, transparent at 103°·1 F., fused at 114°·4; 3, transparent at 103°·1 F., fused at 113°·7 F.; 4, transparent at 103°·1 F., fused

at $113^{\circ}\cdot7$ F.; 4, transparent at $103^{\circ}\cdot1$ F., fused at $111^{\circ}\cdot9$ F.; 5, transparent at $99^{\circ}\cdot1$ F., fused at 109° F.

The colored fatty acids obtained by distillation may easily be prepared colorless by recrystallization from alcohol. The author found the melting-points of several portions of such purified fatty acids to be:—

1st crystallization	$138^{\circ}\cdot4$ F.
2nd crystallization	$140^{\circ}\cdot7$ F.
3rd crystallization	$138^{\circ}\cdot9$ F.
4th crystallization	$137^{\circ}\cdot5$ F.

For comparison with the above determinations of the melting-points of the products of distillation of palm-oil, the author gives the following results obtained by him with fatty acids, obtained by the processes of Masse and Tribouillet, by treating palm-oil with sulphuric acid, and subsequent distillation with superheated steam.

The distillate of palm-oil, obtained in the year 1851 directly from the manufactory at Neuilly, and of a pure white color, was,—I. transparent at $98^{\circ}\cdot5$ F., fused at $106^{\circ}\cdot9$ F.; II. transparent at $94^{\circ}\cdot1$ F., fused at $106^{\circ}\cdot5$ F.

The second portion of the distillate, obtained from the same manufactory, but pressed, and of a dazzling white color,—I. became transparent at $106^{\circ}\cdot7$ F., fused at $123^{\circ}\cdot1$ F.; II. became transparent at $108^{\circ}\cdot5$ F., fused at $120^{\circ}\cdot9$ F.; III. became transparent at $108^{\circ}\cdot5$ F., fused at $120^{\circ}\cdot5$ F. The second and third determinations were repetitions of the first with the same mass of fatty acids.

Palm-oil distillate, from the close of the operation, also from Neuilly, crystallized and pressed, also of a dazzling white color,—I. became transparent at $109^{\circ}\cdot2$ F., fused at $120^{\circ}\cdot4$ F.; II. became transparent at $109^{\circ}\cdot4$ F., fused at $120^{\circ}\cdot4$ F.

After keeping for two years exposed to the light, the substances, which were originally pure white, acquired a somewhat brownish tinge.

Fatty acids, prepared in Vienna according to Tribouillet's method, as employed in August, 1851, in the production of the Belvidere candles, and of a brownish-white color, became transparent at $103^{\circ}\cdot1$ F., and fused at $118^{\circ}\cdot9$ F.

Fatty acids, afterwards prepared in Vienna, were pure white, like those produced in France, and their melting-points agreed pretty well with those of the latter.—*Chem. Gaz., from Sitzungsb. der Akad. der Wiss. zu Wien*, xii, p. 80.

ON THE SAPONIFICATION OF OILS UNDER THE INFLUENCE OF THE SUBSTANCES WHICH ACCOMPANY THEM IN SEEDS.

By J. PÉLOUZE.

Since the researches of M. Chevreul have assimilated fatty bodies to ethers or salts, and made known their decomposition into particular acids and glycerine by the action of hydrated alkalies, it was easy to see that analogous reactions would occur under other circumstances. Thus M. Fremy has shown that the oils and neutral fatty bodies in general are converted into fatty acids by concentrated sulphuric acid. The previous union of this acid with the oleic and margaric acids and glycerine does not at all diminish the final distinctness of the phenomenon of saponification. Beyond these two methods for the saponification of fatty bodies by bases and by acids, nothing certain has hitherto been stated regarding their acidification by other agents. I must however indicate the state of the question at the period when I commenced its study:—

“The foreign substances with which fatty bodies are contaminated exert the same action upon them that a ferment does upon saccharine fluids; the alteration which they undergo excites the decomposition of the glyceric compounds, the fatty acids are set free, as well as the oxide of glyceryle, which sometimes separates without decomposition, as in palm-oil, but is usually decomposed.” (Liebig, *Organic Chemistry*.) “The circumstances necessary for the fermentation of fatty matters are the same as those which occur in all fermentations. It requires the concurrence of an albuminoid body, water, air, and a temperature of from 59° to 86° F. Under these circumstances the substance becomes heated, and soon acquires all the properties of a rancid grease.” (Dumas, *Traité de Chimie*.) “Inodorous and tasteless oils, when in contact with air and moisture, acquire a disagreeable odor and a very persistent taste. Fleshy oleaginous fruits and crushed oleaginous seeds undergo a true fermentation,

the result of which is the disunion of the acids and glycerine. I have had occasion to observe a similar production of free acid during the putrefaction of seeds containing much fatty matter." (Boussingault, *Economie Rurale*.)

M. Bernard has proved that the pancreatic sugar rapidly resolves neutral fatty bodies into acids and glycerine. (*Comptes Rendus*, xxviii. p. 249 and 283.) M. Berthelot, in his thesis, says a few words on the acidification of neutral fatty matters, either natural or artificial, when in contact with the air; he attributes this transformation to the moisture of the atmosphere, and compares it with the decomposition which these same bodies undergo in closed vessels, by the action of water at a high temperature. Lastly, I may mention that seventeen years ago, M. Boudet and myself ascertained that the palm oil of commerce is a mixture of glycerine, of neutral fatty matter, and of acid, the proportion of the latter amounting sometimes to four-fifths of the weight of the oil.

I will not speak here of the slow alteration which fatty matters undergo in the air; this phenomenon, which is still so obscure, appears also to have only a very distant relation with true saponification; it is accompanied by an absorption of oxygen and an evolution of carbonic acid, which do not take place in saponification. The facts of which I am about to present an analysis indicate a very distinct resolution of fatty bodies into acids and glycerine, without the intervention of air. They may be stated shortly as follows:—

When oleaginous seeds are crushed so as to break up their cells, and bring the substances of which they are composed into close contact, the neutral fatty bodies contained in these seeds are converted into fatty acids and glycerine. In this case there is something analogous to what takes place in the grape, the apple, and many other fruits, the sugar contained in which is converted into alcohol and carbonic acid as soon as the cells which separate it from the ferment are destroyed.

Linseed, seeds of rape, mustard, poppy, groundnut, sesame, camelina and chamomile, nuts, walnuts, and sweet and bitter almonds, were pounded in a mortar; the oil taken from them *immediately*, either by pressure or by means of ether or benzine, did not contain any fatty acids, or only contained traces

of them. This first series of experiments, repeated several times, proved that seeds at the moment of division contained the whole of their fatty matter in a neutral state. This agrees with what is generally supposed.

At my desire, M. Bouquet, the director of M. Menier's large chemical establishments, caused a certain quantity of the greater part of the above-mentioned seeds to be ground to meal in his own presence, and sent me portions of this flour, packed in earthen vessels stopped with corks. In a few days I found that the whole of these flours contained considerable quantities of glycerine and fatty acids, which went on constantly increasing for several months. The bruised seeds being kept in closed vessels, there was every reason to think that the air had nothing to do with this reaction. I confirmed this supposition by bruising some of the seeds in which this sort of spontaneous saponification took place most readily, putting them into glass bottles, which they filled completely, and closing them with care. In a few days I obtained quantities of fatty acids which were always readily appreciable and sometimes considerable. Thus walnuts, reduced to a paste, and kept for five days at a temperature of 50° to 77° F., furnished an oil containing 9 per cent. of its weight of fatty acids; and another sample which was kept eight days, gave 15 per cent. Oil of sesame in eight days gave 6 per cent., in a month 17.5 per cent., and in three months 47.5 per cent. of fatty acids. Poppy-oil furnished nearly the same results. Sweet almonds, kept for three weeks, furnished an oil containing only $3\frac{1}{2}$ per cent. of fatty acid; and groundnut-oil at the end of a month contained 6.3 per cent., and in three months 14 per cent. Linseed and rapeseed, kept for three weeks, furnished an oil containing 5 and 6 per cent. of fatty acids.

The saponification in question appears to vary in its intensity, not only with the temperature, but also with the quantities of the bruised seeds employed. I have not yet met with an oil entirely saponified; the one which furnished the largest quantity of acid is poppy-oil. I kept some poppy-seeds reduced to powder, for four months in an earthen vessel; they then furnished an oil containing from 85 to 90 per cent of fatty acid.

I pass now from simply-divided seeds to the cakes produced in the extraction of oils on a large scale; these all contain fatty

acids, and if they be old, it almost always happens that they no longer contain oil, this having become entirely acidified. It would be interesting, in connection with this complete transformation of the neutral fatty matters into acids, to ascertain their influence in the alimentation of cattle, and to follow it from the commencement of this spontaneous saponification, that is to say, from the moment when the seed is crushed to the period of complete acidification. The oil-cakes contain, on an average, 10 per cent. of fatty matters, and it is not to be supposed that the neutral or acid state of these is a matter of indifference in the alimentation of animals.

When oleaginous seeds are reduced to powder, and moistened with water, putrefaction commences in a few days, and they then exhale a fetid and strongly ammoniacal odor. Far from containing more fatty acids than seeds simply crushed, they contain a good deal less; and it appears that the ferment, or the organic matter, whatever it may be, that fulfils its office, is destroyed, and ceases to act upon the neutral oils. I have in vain endeavored to isolate this matter.

In the course of my researches I have ascertained that the sugar which is contained in considerable quantity in walnuts, nuts, and sweet and bitter almonds, is identical with cane-sugar, and that these seeds contained no trace of glucose. Nearly the whole of the sugar remains in the cakes after the oil has been separated by expression. It is so abundant in the cake of the walnut, that when the latter is suspended in water, with a little yeast, an active fermentation is set up in the mixture in a few minutes, and this gives rise to a considerable quantity of alcohol, which may be readily separated by distillation.

In the determination of the proportion of fatty acids mixed with the oils, it is not sufficient to treat the mixture with absolute alcohol; this would lead to the most serious errors. I have, in fact, ascertained that in the presence of the fatty acids the neutral oils are able to dissolve in alcohol. When alcohol is mixed with oil, the addition of oleic acid to the mixture causes the solution of the latter; and if the oleic acid be in great excess in proportion to the oil, the addition of fresh alcohol produces no turbidity in the mixture.

I have made an experiment upon saponification, which I shall

mention here, although it has no connection with what has gone before, because I think it may explain why potash and soda, which are such energetic bases, nevertheless saponify fatty bodies far more slowly than lime. It appeared probable that this depended upon the circumstance, that milk of lime mixes with fatty bodies far better than a solution of potash or soda. The following experiment renders this explanation very admissible. When a neutral oil is dissolved in hot alcohol, and an alcoholic solution of potash is added to it, the mixture, if brought to boiling, is instantly saponified; water does not separate from it the least trace of fatty matter, and the addition of muriatic acid to the solution furnishes fatty acids, which are completely soluble in alkalis and in alcohol. In the same way, if an oil be mixed with an excess of concentrated sulphuric acid, the saponification takes place instantaneously and completely; the whole of the oil is converted into sulpho-fatty acids and sulpho-glyceric acid. In the two cases here referred to, the saponification is immediate, because the bodies brought in contact and those formed, mix in all proportions, and thus present very numerous and intimate points of contact.

The saponification of neutral fatty bodies by potash or soda with alcohol instead of water as the solvent, might be usefully adopted in lectures, as it occupies almost less time in its realization than in its description; and hitherto this curious reaction, performed under ordinary conditions, required far too much time to be capable of execution, even on a very small scale, in the presence of an audience during a lecture. The same facility of execution applies also to the saponification of oils by concentrated sulphuric acid.

As I have mentioned the sulpho-fatty acids of M. Fremy, I may add that the residues of the purification of colza-oil are principally composed of these acids and sulphoglyceric acid. These residues, the price of which has almost suddenly risen from five francs to more than sixty francs per 100 kilogrms., are employed in tanning, and especially in the manufacture of beet-root alcohol, to destroy the froth produced during the fermentations. The manufacturers who make use of them should bear in mind that these residues are not, as they suppose, oil contaminated by the coloring and carbonaceous matters produced

by the action of sulphuric acid upon colza-oil, but that they contain principally double acids, and that they cannot furnish fatty acids without at the same time eliminating a certain quantity of sulphuric acid. A sample of one of these residues, sent to me from Lille by M. Kuhlmann, was entirely soluble in cold water, although from its appearance it might have been mistaken for oil. M. Thenard, who is the founder of the system of purifying lamp oils, now become one of the principal industries of the northern departments, observed that the purification does not take place well except with very concentrated sulphuric acid; this circumstance is now explained by our exact knowledge of the nature of the residue of the purification.

The new facts contained in the memoir of which the preceding is an abstract, are not without their application. Thus linseed-meal is either neutral or acid, according as it is new or old, and must consequently act differently, as a medicament. That which has long been prepared must be rejected, even though it may have been kept in well-closed vessels. I have several times found linseed-meal in the shops, in which all the oil is completely acidified. Milk of almonds, freshly-prepared, contains neutral oil of almonds; by the following day acidification has already commenced. Any edible oil will have a different composition and taste, according to the length of time that has elapsed before the seed from which it was extracted was submitted to pressure. The best oils for the table are those which have been extracted immediately after the crushing of the seed.

Old oil-cakes may be advantageously employed in the manufacture of an economical soap. All that is necessary is to mix them with an alkaline solution; but the quantity prepared must be small, as the albuminoid matter contained in them begins to decompose in about a fortnight, producing a very disagreeable odor.—*London Chem. Gaz.*, May 1st, from *Comptes Rendus*, March 19, 1855, p. 605.*

[* The important bearing which many of the facts contained in this paper have on various preparations and processes in pharmacy, renders it worthy of a careful perusal by our readers. Many anomalies in the solubility of the fixed oils and of their tendency to rancify, may be cleared up.—*Ed. Am. Journ. Pharm.*]

ON A NEW PROCESS FOR ELECTRO-GILDING.

By M. BRIANT.

A modified process for this purpose has been proposed by a M. Briant, and has been the subject of a favorable report, made by M. Jacobi to the Academy of Sciences at St. Petersburg. It consists essentially in the substitution of the oxide for the chloride of gold in the preparation of the gilding-bath, and in the employment of a very feeble current of a constant or sustaining battery.

52 grms. (= 802.88 grs.) of gold are to be dissolved in nitromuriatic acid, and the solution evaporated, for the purpose of obtaining the chloride of gold dry, and as free as possible from acid. This chloride is then dissolved in 5 kilogrms. (= 11 lbs.) of hot water, and 100 grms. (1544 grs.) of well-sifted magnesia added, and allowed to digest at a moderate temperature. The oxide of gold which is separated is found in combination with the magnesia. The magnesia, well washed, is then treated with water acidulated with nitric acid, in the proportion of 375 grms. of acid to 5 kilogrms. of water. The magnesia is dissolved by the acid, leaving the simple hydrated oxide of gold, which is now thrown upon a filter and washed until it is quite free from acid.

It is with the oxide of gold, thus prepared, that M. Briant proposes to form his bath. He takes of—

Yellow prussiate of potash	500 grms.
Caustic potash	120 grms.
Water	5 kilogrms.

To this solution the oxide of gold with the filter is added, and the whole is boiled for twenty minutes. The oxide of gold dissolves, and there is formed at the same time a precipitate of sesquioxide of iron. It is allowed to cool, and is then filtered, by which a yellow liquid fit for use is obtained. The objects to be gilded should be well cleaned, and attached to the negative pole of an element of Daniell's battery, while a plate of platinum is attached to the positive pole.

The gilding may be effected either in a warm or cold solution; in the first case the deposit forms more rapidly, but with less delicacy. In order to obtain a durable deposite, analogous to

fire-gilding, several hours are required. When the liquid is exhausted of its gold, fresh oxide is added, by which a further precipitation of oxide of iron is produced. The gilding obtained by this process admits of being burnished, and of undergoing all the operations employed to produce *mat* or dead gold.

One of the most difficult problems to solve in this branch of manufacture is the production of dead surfaces. Although we know the nature and manipulation of the process, it is only the Parisian workmen who perfectly succeed in this field; hence it is that these operations are always conducted by French workmen, as well in native as in foreign establishments of importance.

The production of dead gold in the ordinary way is always accompanied by loss of metal, inasmuch as it necessitates a system of corrosion of the surface by chlorine. By Briant's process a matted surface can be obtained by galvanic agency not inferior to the best of Paris, while it does not require any of the subsequent operations required in fire-gilding. The *mat* appearance is spontaneously produced as soon as the coating of gold has acquired a certain thickness; it is most beautiful when the operation is carried on in the cold. By a very simple artifice a more or less reddish tint on the one hand, or a whitish one on the other, is produced; it is merely requisite to dilute the bath with more or less water.

When the objects to be gilded are polished and brilliant, the electro-gilding will also be brilliant, and it requires a longer time, and a thicker coating of gold to produce a deadened surface. It is therefore important to communicate, in the first instance, a deadened surface to the objects by the process employed in fire-gilding; or, more economically, by covering them at once with a thin pellicle of copper by the electric agency, which, as is well known, produces a beautiful matted surface. When any part of the object is to be protected from the action of the gilding process, the choice of the substances to be used in "stopping out" these parts is of importance, for it must be remembered that the bath is alkaline; for this purpose plaster impregnated with an alcoholic solution of lac is recommended. —*Chem. Gaz.*, April 16, from *Bulletin de la Société d'Encouragement*.

PATENT GRANTED TO LOUIS FAURE, FOR IMPROVEMENTS IN
THE PROCESS OF MANUFACTURING IODINE.

This invention consists in the application and mode of applying sulphurous acid and chlorine to extracting iodine from the mother-liquors of nitrate of soda, and also from native nitrate of soda.

The following is the mode of treating native nitrate of soda and the mother-liquors therefrom, for extracting iodine therein contained in the state of iodic acid combined with soda, lime, or any other base:—Take about one quart of the mother-liquor of nitrate of soda of the strength of 36° to 37° Beaumé, and pour thereon, in small quantities, sulphurous acid held in solution in water from a graduated test-glass, continually agitating it until the precipitate of iodine freely separates from the liquid. When the liquid, which is slightly shaded, is filtered, it instantly loses its color, and gives no sign of a further precipitate of iodine on the addition of 1 drop of sulphurous acid. This test should be repeated upon about 10 quarts, and if the two results obtained correspond, 500 to 1000 quarts of mother-liquor can confidently be treated; for which it is merely necessary to employ a suitable proportion of sulphurous acid, and a vessel capable of containing a little more than three cubic feet of liquid.

The vessel to be employed should be of a circular form, and made of non-porous bricks, well luted, and afterwards lined with hydraulic cement. The diameter of the upper part of the vessel should be considerably less than that of the lower part, and should be hermetically closed by means of a wooden lid, well adjusted and lined internally with sheets of glass. The liquor is to be agitated in this vessel by means of a vertical shaft or agitator, provided with paddles, and set in motion by a winch and bevil-wheels. The paddles are inclined, and made of sandstone, and disposed for agitating violently the mother-liquors when the addition of sulphurous acid is made.

When the globules of gas which maintain part of the iodine precipitate on the surface of the liquor have been dispelled, the liquor is allowed to rest, and the supernatant liquor is then withdrawn by means of a sandstone siphon. The liquor is afterwards concentrated to extract the nitrate and sulphate of soda and chlorides of sodium and potassium.

The iodine precipitate is transferred to a sandstone fountain,

at the bottom of which a filter is formed, composed of successive layers of quartz-stone finely powdered, and the grain of which decreases in size from bottom to top. After the iodine has been sufficiently drained, it is drawn off without disturbing the lower layer of iodine, and conveyed to a rectangular box, made of plaster of Paris, closed by means of a lid of the same composition, sliding friction-wise in two parallel grooves. The lid of the box should be thick enough (but not too compact) to allow the water of imbibition to filter into the sides and lid of the box. When the iodine is sufficiently dried, it is crystallized by sublimation.

To extract iodine from the mother-liquor in the state of iodate and iodide, the liquors are treated successively with a solution of chlorine and sulphurous acid, previously tested in the following manner:—When the liquor contains little iodide and much iodate, the iodine contained in the iodide is first precipitated by means of chlorine; and as soon as the reaction is terminated, a sufficient quantity of solution of sulphurous acid for decomposing the iodates is added. If the mother-liquor contains much iodide and little iodate, a solution of sulphurous acid is first employed, and afterwards an aqueous solution of previously tested chlorine. Several cubic feet of the mother-liquors may be treated at a time with precision and facility.

The above processes are economical and expeditious, and have the advantage of avoiding the loss of nitrate of potash or soda during the concentration of the liquors, which result cannot be effected by the employment of sulphuric acid of commerce by the ordinary method.—Dated Feb. 14, 1854.—*Chem. Gaz.*, May 15, 1855.

ON LITHIUM AND STRONTIUM.

By M. BUNSEN.

(*Extract of a Letter to M. Regnault.*)

I send you a small specimen of lithium, which I have prepared in concert with Mr. Mathiessen by electrolysis. It forms a wire of several decimetres in length, and about three-fourths of a millimetre in diameter.

Lithium has the color and brilliancy of silver, from which it

would be impossible to distinguish it by its appearance ; but it is so readily oxidizable, that the contact of the air blackens it immediately. It must be preserved in naphtha and in tubes deprived of air. Its ductility is so great, that I was able to draw out a small fragment weighing 5 milligrms. into a wire of several feet in length. It melts at 356° F., and is the lightest of all known solid or liquid bodies ; its density does not exceed 0.5936. It burns with great brilliancy and a white light in oxygen, chlorine, and vapors of bromine, iodine and sulphur. It decomposes cold water immediately, with a brisk effervescence.

I also send a specimen of strontium, prepared in the same way by Mr. Mathiessen. The metal is in the form of a brilliant plate, of a bright brassy-yellow color. On touch-stone it leaves a brilliant line of a golden-yellow color, which however almost instantly becomes of a copper-red, in consequence of superficial oxidation. This metal decomposes water very quickly, even in the cold ; it burns with a very brilliant white light in oxygen, chlorine, bromine, iodine and sulphur. Placed in a volatile circuit with calcium and water, it proved to be negative with regard to the latter metal, which is a very singular fact. Strontium is a very ductile metal ; its density is 2.542, whilst that of calcium is only 1.584.—*Chem. Gaz.*, May 15, from *Comptes Rendus*, April 2, 1855.

PREPARATIONS FROM CANNABIS SATIVA IN INDIA.

(Extract of a Letter from C. J. Muller, Esq., dated Patna, October 28, 1853, addressed to Dr. Hooker.)

In India two varieties of intoxicating drug, prepared from the hemp-plant, are known in the bazaars,—one called *Ganja*, the other *Bhang*. In this part of India the *Ganja* is procured from the district of Rajshahye (north of Calcutta) ; *Bhang* comes chiefly from the districts of Tirhoot, Sarun, and Goruckpoor. In external appearance they differ considerably. *Ganja* is in the form of stalks, three or four feet long, with the inflorescence attached, the whole having been dried and pressed flat ; the color a dirty brown, odor strongly aromatic and heavy, very resinous to the touch. This variety is highly intoxicating, which is accounted for by the abundance of resin (the *churrus* of Nepal and

other parts). Its retail price, deprived of stalks, is at the rate of about Rs. 200 per maund (80 lbs. avoirdupois), this high price being due to the weight of the tax imposed upon it by Government. *Bhang* is in the form of dried leaves without stalks, or at least with only fragments of stalks, and abounds in the dried inflorescence, apparently female. Its color is a dull green; it has not much odor, and is greatly deficient in resinous matter; its intoxicating properties are very slight.

Ganja is smoked somewhat in the same way as tobacco; its continued use invariably brings on severe asthma. *Bhang* is not smoked, but is ground up with water into a pulp, and mixed with other ingredients, so as to make a thick drink, called *Subzee*, reputed to be cooling, and highly conducive to health; people accustomed to use it enjoy excellent health, in fact never get sick.

Now it has always been a question with me whether the plants yielding *Ganja* and *Bhang* are identical; see O'Shaughnessy's *Dispensatory*, &c. The natives say that *Ganja*, like the Rajshahye drug, cannot be manufactured here nor in any of the neighboring districts. *Bhang* grows in abundance, and is absolutely wild in the Bhagulpoor and Tirhoot districts, springing up everywhere in the former like a weed. With the view of inquiring into the matter, I have raised several *Bhang* plants in my garden this year; they are now coming into flower. The plants which have completely flowered are, with the exception of one, to all intents and purposes, monœcious, while all the botanical books I have access to, make *Cannabis* strictly diœcious. The single plant, which appears to bear only female flowers, is not completely in flower yet. The male flowers come last and may yet appear, or I may have overlooked them. You will be interested, I think, in examining the inflorescence, and therefore I enclose some specimens. [They appear to be true *Cannabis sativa*.—ED.] It is requisite to ascertain whether the Rajshahye plant presents the same character, and I have therefore sent to Rajshahye for specimens.

You will perceive that this subject is curious, as bearing upon the alleged fertilization of female flowers of the diœcious class, in the absence of the male plant; for example, *Cœlebogyne*, *Lychnis dioica*, &c. If diœcious plants have a tendency, under certain circumstances of soil and climate, to become monœcious,

the anomaly of fertilization in the absence of the male plant, is in a great measure removed. This remark rests, however, on the assumption that *Cannabis Indica*, *sativa*, *Ganja* and *Bhang*, are all identical, a point I think yet extremely doubtful; though I can scarcely make up my mind to believe that Roxburgh, Ainslie, Wight, Griffith, and Royle, could have failed to ascertain this, if there had been any specific difference.

The female flowers greatly predominate in the specimens under my observation. The anthers in the male flower are often less than five, but are fully charged with pollen.

Believe me, &c., &c.,

C. J. MULLER.

Pharmaceutical Journal, October, 1854.

THE MANUFACTURE OF LIQUOR AMMONIA.

By W. LAWSON.

The economical preparation of liquor ammoniæ has engaged the attention of manufacturing chemists for a considerable time, and seems to have attained its present state in consequence of the rapid spread of gas-lighting, considerable quantities of ammonia being obtained, as one of the bye-products in its manufacture; hence, in almost every town and village where gas is consumed, we find factories for the preparation of liquor ammoniæ. The principle on which ammonia is generated on the large scale does not differ materially from the process employed in laboratory experiments; viz. by introducing into a retort a mixture of an ammoniacal salt with hydrate of lime, and applying a gentle heat; in large factories, however, the salt is prepared in the same premises with the solution. The following process will be found to answer as well as any with which I am acquainted:—

Process.—Common gas liquor is introduced into a series of large stills, and gradually heated up to the boiling-point, when the ammonia is given off with steam, sulphuretted hydrogen, &c.; this impure mixture is conducted through a leaden worm surrounded by water, into a large leaden cistern or box, until a sufficient quantity has been collected for saturation with SO_3 , which combining with the NH_4O , forms sulphate of ammonia, and liberates large quantities of sulphuretted hydrogen; the mixture is ext pumped into leaden vats placed over the stills, and through

which the worm containing the impure solution of ammonia previously alluded to is conducted before it is brought into contact with cold water, and thus the hot vapor is made to concentrate the liquor already produced. After attaining a considerable degree of density, the liquid is drawn off into large leaden boilers set in fire bricks, and completely surrounded by a flue, where it is boiled down to such a density that on cooling it is found to become nearly a mass of salts. Four stills, capable of containing two hundred gallons each, may be readily worked off twice in twenty-four hours, and will yield about eight or ten cwt. of ordinary sulphate of ammonia, depending upon the strength of the gas liquor employed.

This rough sulphate of ammonia is next introduced into a still containing a quantity of milk of lime, and heat gently applied; a rapid evolution of gas soon takes place, which is conducted through upright iron pipes placed in a cool situation over the still, when the whole of the steam in combination with the gas becomes condensed, and falls back into the still, while the pure gas is conducted through leaden or gutta percha tubes into a set of glass carboys, arranged and connected like a series of Woulfe's bottles, about three parts filled with distilled water, into which a piece of glass tube connected with the delivery pipe just dips. Water possesses the power of absorbing this gas in a most extraordinary degree; at a temperature of 50° it is capable of condensing from 600 to 700 times its bulk; by this absorption the bulk of the solution becomes gradually increased, until, in the end, six parts of water become increased to ten, and the specific gravity of the liquid is reduced from 1.00 to 0.875. In applying heat to the still, it is necessary to be exceedingly careful in the first place not to apply it too strongly, otherwise the gas will be evolved so rapidly as to endanger the safety of the receivers by the liquid becoming too hot; and in the second, towards the latter end of the process, especially, to maintain a gradually increased heat, otherwise, a vacuum will be formed, and you will thus lose a large amount of your product. A still, containing about one cwt. of sulphate of ammonia will require about twenty four hours to work off, and will produce from sixty to seventy pounds of the strongest liquor ammoniæ, having a sp. gr. of 0.875, and containing 32.5 per cent. of dry ammonia.—*Pharm. Jour.*, April, 1855.

MANUFACTURE OF CARBONATE OF MAGNESIA.

Native Carbonate of Magnesia.—Native carbonate of magnesia, or magnesite, has been found at Hrubschitz, district of Gromau, in Moravia; at Baudissero and Castellamonte, villages in the vicinity of Turin, Piedmont; in the East Indies; and in the district of Kironile, in the Eubæa. Specimens of the Piedmontese magnesite were exhibited under the name of Giobertite, in the Sardinian section of the Exhibition of 1851. It takes its name of Giobertite from Giobert, who established its true nature, it having passed for a long time for pure alumina. The magnesite from Baudissero contains 68 per cent of magnesia, and that of Castellamonte 26.3 per cent. The native carbonate from Moravia contains about 46 per cent. of magnesia. The analysis by Dr. Henry of a sample of native carbonate from a cargo imported by Mr. Babbington from India, also gave 46 per ct. of magnesia. It constitutes a range of low hills in Hindostan. In the Eubæa there are entire hills of it. The mines or quarries are situated in the villages of Limni, Kotsikir, and Matondi; the produce of the last named village is the best in quality. It is stated that upwards of 2000 tons are annually exported to Smyrna and England. The Eubæan magnesite contains 44 per cent. of magnesia. It is used for the manufacture of pure magnesia, and, as mentioned in our last number, Epsom salt. It is a very useful ingredient in the composition of bricks for refractory furnaces, on account of its property of resisting the heat of fire. Specimens of native carbonate of magnesia from Madras, and of Epsom salt manufactured therefrom, were shown in the exhibition of 1851; also specimens of magnesite from Eubæa.

In England, carbonate of magnesia is found in combination with carbonate of lime, forming what is called magnesian limestone or dolomite. The magnesian limestone extends from Newcastle to Nottingham. Annexed are the analyses of five specimens:

	1.	2.	3.	4.	5.
Carb. Lime	57.50	55.70	54.19	51.10	54.05
" Magnesia	39.40	41.60	41.37	40.20	38.58
Silica	0.80	—	2.53	3.60	1.80
Oxide of Iron	0.70	0.40	0.30	1.80	1.36
" " Manganese	—	—	—	trace	1.50
Water and loss	1.60	2.30	1.61	3.30	2.71
	<hr/> 100.00	<hr/> 100.00	<hr/> 100.00	<hr/> 100.00	<hr/> 100.00

The preparation of carbonate of magnesia, the *Magnesia Alba* of P. L. 1787, was for several years a considerable secret in the possession of some particular persons. It formerly bore the name at Rome of Count Palma's powder. Many, however, are of opinion that the mode of preparation was carried from Germany to Italy. Lancisi, in 1717 (and, it is said, Valentini, in 1707), and afterwards Hoffman, in 1722, made public the process of manufacture. At that time it was extracted from the mother-liquor which remains after the crystallization of rough nitre (chloride of magnesium) by precipitation with a solution of carbonate of potash or soda. The name *Miraculum Chemicum* was given to it from the circumstance of a precipitate being formed by the admixture of two pellucid solutions.

Manufacture of Carbonate of Magnesia from Epsom Salt.—The manufacture of carbonate of magnesia from sulphate of magnesia, was first made known by Henry, of Manchester. The process communicated by him was as follows:—"Dissolve any quantity of sal catharticus amarus in its own weight of water; filter, and add to it by degrees a filtered solution of pearl or potashes, in an equal quantity of water, stirring them gently, until the mixed liquids have acquired the appearance of a complete coagulum. Then desist from adding any more of the alkaline lixivium, and immediately throw the mixture into a large vessel of boiling water; keep it boiling a quarter of an hour, then take it out and put it into glazed earthen vessels. As soon as the powder hath subsided, and before the water is quite cold, pour it off, and add a fresh quantity of boiling water; repeat these ablutions with hot water several times until the liquor has entirely lost its saline taste; then let it be so agitated as to suspend the finer parts of the powder, in which state decant it into other vessels, and having separated the water from the magnesia by inclination, put it on large chalk-stones, until a considerable part of the humidity is absorbed. Then wrap it up in sheets of white paper, and dry it before the fire. Pour hot water upon the remaining powder, stir and decant it in its turbid state, and separate the magnesia from the water as before; thus the whole, or most of it, will be reduced to an equal degree of fineness. The larger the quantity of water into which the precipitated powder is cast, the

more speedily and perfectly will the vitriolated tartar, which is formed by the union of the alkali with the acid of the sal catharticus, be washed off. The neutral salt should be washed off as quickly as possible, otherwise, by allowing the mixture to stand for some time the powder concretes with minute grains, which, when viewed with a microscope, appear to be assemblages of needles diverging from a point. These concretions cannot be redissolved by any washing, however long continued. Dr. Black orders four times the quantity of water to that of the solution for throwing the coagulum into; but Mr. Henry observes that this quantity is much too little. The water should be pure, and distilled water is the best. Hard or impure water makes magnesia coarse and disagreable.

In the Pharmacopœias of the London and Edinburgh Colleges carbonate of soda is directed to be employed in the manufacture of carbonate of magnesia from sulphate of magnesia. The two *boiling hot* solutions are run together into large wooden vessels, while a workman keeps the whole in continued agitation for some time. The mixture is afterwards allowed to remain at rest for an hour or so, to permit the precipitated carbonate of magnesia to subside. When this deposit has taken place, the fine precipitate is repeatedly washed with pure water, to remove all traces of the sulphate of soda formed by the double decomposition of the two salts. The carbonate of magnesia is then allowed to drain, until it acquires sufficient consistency to be formed into small pieces of the shape of parallelopipedons, and then dried on wooden shelves in a stove at a low temperature.

On account of the great tendency of carbonic acid to form soluble bi-salts, it is necessary that the solutions of sulphate of magnesia and carbonate of soda should be mixed *boiling* in the manufacture of carbonate of magnesia. The magnesia alba, or carbonate of magnesia of commerce, is a *subcarbonate*, consisting of a combination of neutral carbonate of magnesia and hydrate of magnesia. The neutral carbonate is a crystallizable salt, which may be frequently observed depositing in the bottles containing solutions of the bicarbonate in Murray's fluid magnesia. This neutral carbonate is decomposed when put into water. If the water be cold it is decomposed into magnesia alba and bicarbonate; if the water be boiling it is resolved wholly into mag-

nesia alba or the subcarbonate; the excess of carbonic acid being expelled.

Heavy Carbonate of Magnesia.—Pereira gives the following as the method which he has seen followed in a large and esteemed manufactory:—Add one volume of a cold saturated solution of carbonate of soda to a boiling mixture of one volume of a saturated solution of sulphate of magnesia and three volumes of water. Boil until effervescence has ceased, constantly stirring with a spatula. Then dilute with boiling water, set aside, pour off the supernatant liquor, and wash the precipitate with hot water on a linen cloth. Afterwards dry it by heat in an iron pot.

Manufacture of Carbonate of Magnesia from Bittern.—In the manufacture of carbonate of magnesia from bittern, (chloride of magnesium), or the mother-liquor remaining after the extraction of common salt from sea-water, the crude carbonate of ammonia, obtained in the distillation of bones, or the ammoniacal liquor of gas-works, is used as the decomposing agent. In this case carbonate of magnesia is precipitated and muriate of ammonia obtained in solution. The after treatment is the same as that described above. Dolomite is also employed for the decomposition of bittern, in the same way as that of artificial chloride of magnesium. In this process the carbonate of lime of the dolomite becomes converted into chloride of calcium, leaving the carbonate of magnesia behind as an insoluble powder.

● *Manufacture of Carbonate of Magnesia from Dolomite.*—In his patent of January 23d, Dr. Richardson claims the manufacturing of magnesia and carbonate of magnesia from magnesian limestone by the employment of muriatic acid. The quantity of the acid used should be slightly in excess of the exact quantity required to dissolve out the lime in the limestone operated upon. This may be either burnt to expel the carbonic acid and then slaked in pits previous to adding the muriatic acid, or it may be employed in the natural state, reduced to an impalpable powder, the product in the former case being magnesia, and in the latter an impure carbonate, which may either be employed as such, or be deprived of its carbonic acid by the application of heat. The acid preferred for this purpose is the weak muriatic acid, which is at present allowed to run to waste in alkali works, and the pro-

portion of it used is a quantity containing about thirty-seven parts of pure hydrochloric acid to every twenty-eight parts of lime in the calcined magnesian limestone, and the same for every fifty parts of carbonate of lime in the uncalcined stone.

The magnesia or carbonate of magnesia thus obtained, Dr. Richardson employs in the magnesian salts, as noticed in the article on "Epsom Salt," in the last number of the *Pharmaceutical Journal*. He also manufactures carbonate of magnesia by causing a stream of carbonic acid to be forced through vessels containing magnesia obtained as before mentioned, diffused through water. A bicarbonate is thus produced, which enters into solution with the water, and this is subsequently converted into carbonate, which is obtained as a precipitate by the application of a gentle heat to the vessel containing the solution of bicarbonate.

The best process for the manufacture of carbonate of magnesia is, undoubtedly, that patented by Mr. H. L. Pattinson, Sept. 24th, 1841. The process is as follows:—Magnesian limestone, as rich as possible in magnesia, is reduced to powder, and sifted through a sieve of forty or fifty meshes to the linear inch. It is then heated red-hot in an iron retort or reverberatory furnace for two or three hours, when, the carbonic acid being expelled from the carbonate of magnesia, and not from the carbonate of lime, the whole is withdrawn from the retort or furnace and allowed to cool. The magnesia contained in the limestone is now soluble in water impregnated with carbonic acid gas, and to effect this solution Mr. Pattinson proceeds as follows:—An iron cylinder lined with lead, of any convenient size, say four feet long by two feet and a half in diameter, is provided, furnished with a safety valve and agitator, which latter may be an axis in the centre of the cylinder, with arms reaching nearly to the circumference—all made of iron and covered with lead. This cylinder is placed horizontally, and one extremity of this axis is supported within it by a proper carriage, the other extremity being prolonged, and passing through a stuffing-box at the other end of the cylinder, so that the agitator may be turned round by applying manual or other power to its projecting end. A pipe leading from a force-pump is connected with the under side of the cylinder, through which carbonic acid gas may be forced

from a gasometer in communication with the pump, and a mercurial guage is attached to show at all times the amount of pressure within the cylinder, independently of the safety-valve. Into this cylinder, so fitted up as described, from 100 to 120 lbs. of the calcined limestone is introduced, with a quantity of pure water nearly filling the cylinder; carbonic acid gas is next pumped in, the agitator being constantly turned the while, and more and more gas forced in until absorption ceases under a pressure of five atmospheres. The whole is allowed to remain in this condition for three or four hours, and the contents of the cylinder are then run off into a cistern and allowed to settle. The clear liquor is now a solution of carbonate of magnesia in water, impregnated with carbonic acid gas, or a solution of bicarbonate of magnesia having a sp. gr. of about 1028, and containing about 1600 grains of carbonate of magnesia to the imperial gallon.

Mr. Pattinson considers the best mode of obtaining a solution of bicarbonate of magnesia from magnesian limestone, is to operate upon the limestone after being calcined at a white heat in the way described, but the process may be varied by using in the cylinder the mixed hydrates of lime and magnesia, obtained by completely burning magnesian limestone in a kiln, as commonly practised, and slaking it with water in the usual manner; or, to lessen the expenditure of carbonic acid gas, the mixed hydrates may be exposed to the air for a few weeks, until the lime has become less caustic by the absorption of carbonic acid from the atmosphere, or the mixed hydrates may be treated with water, as practised by some manufacturers of Epsom salt, until the lime is wholly or principally removed, after which the residual rough hydrate of magnesia may be prepared for solution in the cylinder by dissolving magnesian limestone in hydrochloric acid, and treating the solution, or a solution of chloride of magnesium, obtained from sea-water by salt-makers in the form of bittern, with its equivalent quantity of hydrate of lime, or of the mixed hydrates of lime and magnesia obtained by completely burning magnesian limestone and slaking it as above. Mr. Pattinson states that, when he uses this solution of bicarbonate of magnesia for the purpose of preparing carbonate of magnesia, he evaporates the solution to dryness, by which he at once obtains a pure carbonate of magnesia, without the necessity

of using a carbonated alkali, as in the old process; and from this he prepares pure calcined magnesia by calcination in the usual manner, or, instead of boiling the solution to dryness he merely heats it for some time to the boiling point, by which excess of carbonic acid is partly driven off, and pure carbonate of magnesia precipitated, which is collected and dried in the usual way.

Manufacture of Carbonate of Magnesia from Magnesite.—Dr. Richardson's more recent improvements in the manufacture of carbonate of magnesia, are contained in the specification of his patent, dated June 14th, 1853. He takes any impure hydrate, or carbonate of magnesia, free from lime, or nearly so, such, for instance, as *magnesite*, (the impure hydrate of magnesia, which is a waste product in Ward's process of carburating soda ash, being preferred) and diffuses it through water, so as to form a cream or milk-like fluid, which he runs into a large soda-water machine, wherein he pumps carbonic acid, in the same manner as when making soda-water. Or, he partially fills a wooden box, divided into cells by partitions running from the top and bottom alternately, with this milk-like fluid, and by means of a steam-jet, or air-pump worked by suitable machinery, he draws a stream of carbonic acid through a whole series of compartments from a furnace filled with coke or charcoal. When the liquid becomes saturated with bicarbonate of magnesia, or stands at 5° to 11° on Twaddell's hydrometer (sp. gr. 1.025 to 1.055), it is drawn off, and after standing about an hour a small quantity of a cream of magnesite is gradually added, which he finds carries down all the oxide of iron and other impurities, leaving a clear pure solution of bicarbonate of magnesia. This solution is heated to expel the excess of carbonate precipitates, and is collected and treated in the usual way, or a quantity of pure magnesia in suspension in water is added until the whole is precipitated as carbonate of magnesia.

The furnace employed for producing carbonic acid is filled with coke or charcoal, and is supplied with air through an opening at the bottom, and another higher up, on a level with the top of the fuel. The air may be drawn through by means of a jet of steam or otherwise, or forced forwards by a blowing cylinder or fan-blast, so regulated by valves or dampers, that the supply of

air entering at the upper opening shall be a little more than sufficient to convert all the carbonic oxide into carbonic acid, so as to economise the fuel and render the action of the gas more energetic on the milk of magnesia. Carbonic acid obtained from any other source equally answers the purpose.—*London Pharm. Journ.*, November 1854.

Varieties.

On Perfumery. By SEPTIMUS PIESSE.

(Continued from page 278.)

The thirteen previous articles which have appeared in the "Annals" have exclusively treated of Wet Perfumes, the present matter relates to Dry Perfumes; sachet powders, tablets, pastilles, fumigation by the aid of heat of volatile odorous resins, &c., &c. The perfumes used by the ancients were, undoubtedly, nothing more than the odoriferous gums which naturally exude from various trees and shrubs indigenous to the Eastern hemisphere—that they were very extensively used and much valued, we have only to read the Scriptures for proofs:—"Who is this that cometh . . . perfumed with myrrh and frankincense, with all the powders of the merchant?" (Song of Solomon iii. 6.) Abstaining from the use of perfume in Eastern countries is considered as a sign of humiliation:—"The Lord will take away the tablets, and it shall come to pass that instead of a sweet smell there shall be a stink."—(Exod. xxxv. 22; Isaiah iii. 20, 24.) The word tablets in this passage means perfume boxes, curiously inlaid, made of metal, wood, and ivory. Some of these boxes may have been made in the shape of buildings, which would interpret the word *palaces* in Psalm xiv. 8:—"All thy garments smell of myrrh, and aloes, and cassia, out of the ivory palaces, whereby they have made thee glad." From what is said in Matt. ii. 11, it would appear that perfumes were considered among the most valuable gifts which man could bestow:—"And when they (the wise men) had opened their treasures, they presented unto him (Christ) gifts; gold, and frankincense, and myrrh." As far as we are able to learn, all the perfumes used by the Egyptians and Persians during the early period of the world were *dry* perfumes, consisting of spikenard (*Nardostachys jatamansi*), myrrh, olibanum, and other gum resins, nearly all of which are still in use by the manufacturers of odors. Among the curiosities shown at Alnwick Castle is a vase that was taken from an Egyptian catacomb. It is full of a mixture of gum resins, &c., which evolve a pleasant odor to the present day, although probably 3,000 years old. We have no doubt that the original use of this vase and its contents were for perfuming apartments, in the same way that pot pourri is now used.

SACHET POWDERS.

The French and English perfumers concoct a great variety of these substances, which being put into silk bags, or ornamental envelopes, find a ready sale, being both good to smell, and economical as a means of imparting an agreeable odor to linen and clothes as they lie in drawers. The following formula shows their composition. Every material is either to be ground in a mill, or powdered in a mortar, and afterwards sifted.

SACHET AU CHYPRE.

Ground rose wood 1 lb. | Ground santal wood 1 lb.
 " cedar wood 1 lb. | Otto of rhodium, or otto of rose 3 drms.
 Mix and sift, it is then fit for sale.

SACHET A LA FRANGIPANNE.

Orris root powder 3 lbs. | Otto of neroly {
 Vitvert powder ½ lb. | " rose { of each . 1 drachm.
 Santal wood powder ½ lb. | " santal {
 Musk pods, ground 1 oz.

The name of this sachet has been handed down to us as being derived from a Roman of the noble family of Frangipani. Mutio Frangipani was an alchemist, evidently of some repute, as we have another article called *rosolis*, or *ros-solis*, *sun-dew*, an aromatic spirituous liquor, used as a stomachic, of which he is said to be the inventor, composed of wine, in which is steeped coriander, fennel, anise, and musk.

HELIOTROPE SACHET.

Powdered orris 2 lbs. | Vanilla beans ½ lb.
 Rose leaves, ground 1 lb. | Grain musk ½ oz.
 Tonquin beans, ground ½ lb. | Otto of almonds 5 drops.

Well mixed by sifting in a coarse sieve, it is fit for sale.

It is one of the best sachets made, and is so perfectly *au naturel* in its odor to the flower from which it derives its name, that no person unacquainted with its composition would, for an instant, believe it to be any other than the "real thing."

LAVENDER SACHET.

Lavender flowers, ground . . . 1 lb. | Otto of lavender ½ oz.
 Gum benzoin, in powder . . . ½ lb.

SACHET A LA MARECHALE.

Powder of santal wood . . . ½ lb. | Cloves, ground ½ lb.
 " orris root ½ lb. | Cassia bark ½ lb.
 Rose leaves, ground ½ lb. | Grain musk ½ drachm.

SACHET A LA MOUSSELAINE.

Vitvert, in powder 1 lb. | Benzoin, in powder . . . ½ lb.
 Santal wood { each ½ lb. | Otto of thyme 5 drops.
 Orris { " roses ½ drachm.
 Black currant leaves (*casse*) . . ½ lb.

MILLEFLEUR SACHET.

Lavender flowers, ground }
 Orris } each 1 lb. | Tonquin {
 Rose leaves } | Vanilla { each ½ lb.
 Benzoin } | Santal {
 Cinnamon } each 2 oz. | Musk and civet each . . 2 drachms.
 Allspice } | Cloves, ground ½ lb.

PORTUGAL SACHET.

Dried orange peel	1 lb.	Otto of orange peel	1 oz.
" lemon peel	$\frac{1}{2}$ lb.	" neroly	$\frac{1}{2}$ drachm.
" orris root	$\frac{1}{2}$ lb.	" lemon grass	$\frac{1}{2}$ drachm.

PATCHOULY SACHET.

Patchouly herb, ground	1 lb.	Otto of patchouly	$\frac{1}{2}$ drachm.
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Patchouly herb is often sold in its natural state, as imported, tied up in bundles of half-a-pound each.

POT POURRI.

This is a mixture of dried flowers and spices *not* ground.

Dried lavender	1 lb.	Broken cloves	} each 2 oz.
Whole rose leaves	1 lb.	" cinnamon	
Crushed orris (coarse)	$\frac{1}{2}$ lb.	" allspice	
Table salt	1 lb.		

We need scarcely observe that the salt is only used to increase the bulk and weight of the product in order to sell it cheap.

OLLA PODRIDA.

This is a similar preparation to pot pourri. No regular form can be given for it, as it is generally made, or "knocked-up," with the refuse and spent materials derived from other processes in the manufacture of perfumery, such as the spent vanilla after the manufacture of tincture or extract of vanilla, or of the grain musk from the extract of musk, orris from the tincture, tonquin beans, after tincturation, &c., &c., mixed up with rose leaves, lavender, or any odoriferous herbs.

ROSE SACHET.

Rose heels	1 lb.	Otto of roses	$\frac{1}{2}$ oz.
Santal wood, ground	$\frac{1}{2}$ lb.		

SANTAL WOOD SACHET.

This is a good and economical sachet, and simply consists of the ground wood. Santal wood is to be purchased from some of the wholesale drysalters; the drug-grinders are the people to reduce it to powder for you—any attempt to do so at home will be found unavailable, on account of its toughness.

SACHET (*without a name*).

Dried thyme	} of each $\frac{1}{2}$ lb.	Dried rose heels	1 lb.
" lemon thyme		Ground cloves	2 oz.
" mint		Allspice	2 oz.
" marjoram		Musk in grain	1 drachm.
" lavender			

VERVAINE SACHET.

Lemon peel, dried and ground	1 lb.	Otto of lemon peel	$\frac{1}{2}$ oz.
Lemon thyme	$\frac{1}{2}$ lb.	" bergamot	1 oz.
Otto of lemon grass	1 drachm.		

VITIVERT SACHET.

The fibrous roots of the *Anthoxanthum muricatus* being ground, constitutes the sachet, bearing the name as above, derived from the Tamool name, *vittie vayer*, and by the Parisian *vetiver*. Its odor resembles myrrh. Viti-

vert is more often sold tied up in bunches, as imported from India, than ground, and is used for the prevention of moth, rather than as a perfume.

VIOLET SACHET.

Black currant leaves (<i>Casse</i>)	1 lb.	Grain musk	. . . . .	1 drachm.
Rose heels or leaves	. . . 1 lb.	Tonquin beans	. . . . .	½ lb.
Orris root powder	. . . 2 lbs.	Gum benzoin, in powder	. . . . .	½ lb.
Otto of almonds	. . . . ½ drachm.			

Well mix the ingredients by sifting; keep them together for a week in a glass or porcelain jar before offering for sale.

There are many other sachets manufactured besides those already given, but for actual trade purposes there is no advantage in keeping a greater variety than those named. There are, however, many other substances used in a similar way; the most popular is the

PEAU D'ESPAGNE.

Peau d'Espagne, or Spanish skin, is nothing more than highly perfumed leather. Good sound pieces of wash leather are to be steeped in a mixture of ottoes, in which are dissolved some odoriferous gum resins, thus:—Otto of neroli, otto of rose, santal, of each half an ounce; otto of lavender, verbena, bergamot, of each a quarter of an ounce; otto of cloves and cinnamon, of each two drachms; with any others thought fit. In this mixture dissolve about two ounces of gum benzoin; now place the skin to steep in it for a day or so, then hang it over a line to dry. A paste is now to be made by rubbing in a mortar one drachm of civet with one drachm of grain musk, and enough solution of gum acacia or gum tragantha to give it a spreading consistence; a little of any of the ottoes that may be left from the steep stirred in with the civet, &c., greatly assists in making the whole of an equal body; the skin being cut up into pieces of about four inches square are then to be spread over, plaster fashion, with the last named compost; two pieces being put together, having the civet plaster inside them, are then to be placed between sheets of paper, weighed or pressed, and left to dry thus for a week; finally, each double skin, now called peau d'Espagne, is to be enveloped in some pretty silk or satin, and finished off to the taste of the vender.

Skin or leather thus prepared evolves a pleasant odor for years, and hence they are frequently called "the inexhaustible sachet." Being flat they are much used for perfuming writing-paper.—*Annals of Pharmacy*.

Note on a New method of Biting for Heliographic Engraving upon Steel. By NIEPCE DE SAINT-VICTOR.—The author has been engaged in researches with a view to obtain a substitute for nitric acid in heliographic engraving upon steel. The fumigations indicated by him often give too much or too little resistance to the varnish, so that it was necessary to find some mordant which would act upon the metal without attacking the varnish.

For this purpose he has found nothing better than water saturated with

iodine at a temperature of 50°–59° F. at the outside, so that it may have a golden-yellow color with no trace of reddish-orange.

The biting is commenced by covering the plate with iodized water, which is renewed in ten minutes or a quarter of an hour; a part has then combined with the steel to form iodide of iron, and the other is volatilized, so that it is important to change the iodized water two or three times, that is to say, until the plate is considered to be sufficiently bitten.

The biting takes place slowly, and is never deep enough, unless the operation is completed by water slightly acidulated with nitric acid; it has then sufficient action to eat into the metal to a greater depth than the iodine, without, however, attacking the ground. The application of this method has given excellent results.—*London Chem. Gaz. from Comptes Rendus*, March 12, 1855, p. 584.

Upon some Oils of the Dolphin and Phocenic Acid.—By M. BERTHELOT. —Since the discovery of valerianic acid, it has been supposed that the volatile oils of the fat of the dolphin, to which Chevreul first gave the name of phocenic acid, is valerianic acid. Probable as this identity appeared, however, it was doubted by some chemists. But Heintz's work upon the fats must especially be regarded as contradicting this identity, as Heintz found that the neutral fats of the animal kingdom only contained numbers of atoms of carbon divisible by four. Bertheolot has therefore examined the fat of several dolphins, and amongst others that of *Delphinus Marginatus*, Cuv., and also that of some sharks, such as *Mustellus vulgaris*, Cuv., and *Scymnus ni-censis*, Cuv., and always found that the volatile acid was valerianic acid. To ascertain the presence of volatile acids in fat, Bertheolot distils, at a gentle heat 100 grms. of the fat with 100 grms. of a mixture of alcohol and sulphuric acid. If the first portion of the distillate be mixed with water, the ethers of the volatile acids separate.

The author afterwards prepared valerianic acid in the ordinary manner, and analysed it and its ether. The results obtained were distinctly in favor of the identity of the so-called phocenic acid with valerianic acid.—*Ibid*, from *Journ. de Pharm et de Chim.*, 3 ser., xxvii. p. 35.

Tasteless Infusion of Senna.—Dr. Brandeis recommends a cold infusion of senna for twelve hours in a covered vessel, as especially useful in infantile therapeutics. By this modification of the process usually employed, the water contains only the cathartic and the coloring matter, leaving the essential oil, the fatty matter, and the irritating resin, which are only soluble in hot water. Senna water thus prepared cold, is almost insipid, and its taste completely disappears when mixed with infusion of coffee or tea.—*Boston Med. and Surg. Journ. from Archives Generales de Med. for April*.

Limits of the vaporization of Mercury.—Till now it has been admitted with Faraday that the vaporization of mercury is very limited; that at 20°

C. the mercurial vapor may reach a height of one decimeter, and at a lower temperature to 0° C., it does not exceed two centimeters. Faraday employed in his experiments a plate of gold placed at the requisite height. M. Brame, Professor of Chemistry at Tours, has found on his trials, that the vapor passes much beyond these limits. He used a reagent more sensitive than gold, viz., sulphur deposited in a vesicular state on a plate of glass, which becomes brown under the influence of mercurial vapor. In the vaults of the Paris Observatory where the temperature is uniform, this reaction took place at a height of 1.20 metres in the space of twenty days; and by prolonging the experiment he was enabled to condense on the surface a considerable quantity of mercury. It was the same with mercurial ointment, silver amalgam, tin amalgam, &c. From these experiments and others tending towards the same end, M. Brame concludes that the vapor of mercury is subjected to the ordinary law for the mixture of gases and vapors.—*Siliman's Journal*, May, 1855.

Anesthesia of Bees.—Apiculturists often find it desirable to stupify bees, when, for instance, there are two feeble swarms and it is best to kill the queen of one. In Brittany, as well as in Alsace, the smoke of a common puff ball, *Lycoperdon cryptus Lupi*, has been employed from time immemorial. In the Dict. d'Hist. Nat. of D'Orbigny, it is reported that in Southern Russia the *Lycoperdon horrendum* and the *Endoneuron suberosum* are used to intoxicate the bees in order to get their honey. Dr. de Beauvoys has taken up this subject, and has found that the best species for the purpose is the *Lycoperdon giganteum*. In using it, a piece of the Lycoperdon is put on burning charcoal contained in a chafing dish and covered with a funnel of stoneware, and the smoke is directed from it into the suspended hive: a cloth laid on the ground receives the bees as they fall. The experiments have been repeated before the Zoological Society, in which the stupefaction of the bees continued for half an hour.—*Ibid.*

Pisciculture.—This important subject has occupied much the Society of Acclimation. A method has now been ascertained by which we may know the maturity of the eggs of certain fishes, a method which has been arrived at through the researches of MM. Valenciennes and Frémy on the eggs of osseous fishes. These investigators have found that the eggs, while adhering to the ovarian lamellæ, give with water an abundant precipitate of a substance named by them *ichtuline*; while the mature egg affords no ichtuline: whence the eggs of certain fishes are ready for fecundation when they give no precipitate with distilled water. In this trial with the Cyprinoids, for example, an egg is taken and broken upon a plate of glass, and a drop of pure water added: if the liquid is not clear the egg is not mature.—*Ibid.*

Production of Alcohol.—The question bearing on the cheap production of alcohol has not made much progress since my last communication. New

projects and new processes have been sent to the *Société d'Encouragement* without appearing to resolve the problem. Asphodel, in this connection, may look forward to a fine future. According to Dumas, the quantity of bulbs of asphodel in Algeria is enormous, they cover a space 20 leagues square, and are so crowded that clearing them out is a great labor.

General Vaillant, who commands one of the military divisions in French Algeria, states that the pulp proceeding from the extraction of the alcohol from asphodel may be used as food for hogs, who eat it without hesitation and with advantage. In the month of May, June, July, and August, the proportion of the fermentable principle reaches even 12 p. c., nearly the maximum of that of cane sugar, and almost double that of beet sugar.

M. Dumas also calls attention to another plant more abundant still in Algeria, the *Scilla maritima*, whose large and dry bulbs are so crowded in the soil that no space is left between. According to M. Fée, Professor of Botany in the Faculty of Medicine of Strasburg, the *Scilla* affords more than 30 p. c. of saccharine matter. It is however important to remark that it contains also a bitter principle which may injure the alcohol.—*Ibid.*

On Bitumen Springs of California.—It is an interesting fact, which I believe is not generally known, that there are numerous places in the Coast Mountains, south of San Francisco, where *bitumen* exudes from the ground, and spreads in great quantity over the surface. These places are known as *Tar Springs*, and are most numerous in the vicinity of Los Angeles. It is also common to meet with large quantities of this material floating on the Pacific, west of Los Angeles, and northward towards Point Conception. I have seen it, when, passing this point, floating about in large black sheets and masses. They are probably the product of submarine springs; or they may be floated down by small streams from the interior.*

Some of the springs that I examined near Los Angeles were nothing more than overflows of bitumen or asphalt from a small aperture, around which it had spread out so as to cover a circular space of about thirty feet in diameter. This had hardened by exposure, and was covered and mingled with dust and sand, which quickly adheres to its clean and fluid surface. The outer portions were hard as a pavement; and the mass was highest towards the centre, where it was soft and fluid, like melted pitch. It was thus evident that all the hard portions had risen in a fluid state, and by the heat of the sun had been gradually spread out over the surface. Being constantly exposed to the dust, it had become so thoroughly incorporated with the asphalt that the compound had all the consistency of an artificial admixture.

* I am informed by Lieutenant W. P. Trowbridge, of the United States Engineer Corps, that the channel between Santa Barbara and the Islands is sometimes covered with a film of mineral oil, giving to the surface the beautiful prismatic hues that are produced when oil is poured on water.

The spring that I have described is one of several similar ones, on the bank of a small brook about seven miles from Los Angeles.

I passed up and down the stream just mentioned for a short distance, on each side, and found one or two natural exposures of the edges of nearly horizontal shales of a light color, and very thinly stratified. The lowest layers were charged with *bitumen*, and were of various shades of brown and black.

These shales were principally siliceous, and were overlaid by a stratum of pebbles and sand, probably beach-shingle.

Bituminous shales are also exposed in the harbor of San Pedro, near the base of the vertical bluffs of sedimentary formations along the beach. They have a dark brown or black color, and appear to be argillaceous. They emit a strong bituminous odor when struck by the hammer.—*Silliman's Journal*, W. P. Blake, in *Williamson's Report of Pacific Survey*.

NOTICE.

TO THE PHARMACEUTISTS AND DRUGGISTS OF THE UNITED STATES.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The 3rd Section, First Article, of the Constitution requires the President, at least three months previous to the annual meeting, to publish a call, in all the Pharmaceutical, and in such other Medical Journals as he may select, stating therein the objects of the Association and the conditions of the Membership. In compliance with this duty, you are hereby notified, that the next annual meeting of the Association will be held in the City of New York, on the second Tuesday (11th) of September, 1855, at 3 o'clock, P.M.

The objects of the Association are, to deliberate on the condition of our profession, the advancement of Pharmaceutical knowledge, and the elevation of the professional character of Apothecaries and Druggists throughout the United States.

CONDITION OF MEMBERSHIP.

Section II.—ARTICLE I. All pharmacutists and druggists who shall have attained the age of twenty one years, whose character, morally and professionally, is fair, and who, after duly considering the obligations of the Constitution and Code of Ethics of this Association, are willing to subscribe to them, shall be eligible for membership.

ARTICLE II. The members shall consist of delegates from regularly constituted Colleges of Pharmacy and Pharmaceutical Societies, who shall present properly authorized credentials, and of other reputable Pharmacutists feeling an interest in the objects of the Association, who may not be so delegated, the latter being required to present a certificate signed by a majority of the delegates from the places whence they come. If no such dele-

gates are present at the Association, they may, on obtaining the certificates of any three members of the Association, be admitted, provided they be introduced by the Committee on Credentials.*

ARTICLE IV. Every member shall pay into the hands of the Treasurer the sum of two dollars as his yearly contribution.

ARTICLE V. Every local Pharmaceutical Association shall be entitled to five delegates.

W. B. CHAPMAN, President.

Cincinnati, April 11, 1855.

[* *Note by the Editor*.—The wording of the second article of the constitution has been understood by many in an exclusive sense. It should be distinctly understood that all reputable Pharmacutists and druggists, who are favorable to the objects of the Association, will be welcomed at the meeting.]

Editorial Department.

AMERICAN PHARMACEUTICAL ASSOCIATION ; MEETING OF 1855.—It is greatly to be desired that the approaching meeting of the Association will be the commencement of a new era in its history, marked by a greater manifestation of interest on the part of the pharmacutists of the United States, and especially by those located in and near New York City, the place of meeting. The most numerous body of pharmacutists in the United States, with the largest drug mart within their borders, much is justly to be expected from them in the furtherance of this excellent enterprize, which, as it originated in their city, they should feel a pride in promoting. The subscription, which is but two dollars annually, is no impediment to membership to even the least wealthy members of the pharmaceutical body. It is to be hoped that scientific subjects will occupy more of the attention of the meeting than usual, that the Transactions may possess a permanent interest. Heretofore the Proceedings have been published in Philadelphia. It is right that other places should take part in this branch of the operations, and we hope that our New York friends will claim it for the coming occasion. Our readers will find the official announcement at page 378.

PURE OR DEODORIZED ALCOHOL.—It is an important item in the economy of the pharmaceutical laboratory, to possess a supply of pure alcohol fit for the nicer preparations, and for such perfumery as is usually prepared by the apothecary, as cologne, lavender, Florida, and other so-called "waters." The Messrs. Atwood, of Waltham, having patented a process for purifying alcohol from fusel oil and other odorous impurities, in which manganic acid is employed, have gradually been extending the "right" to manufacture it. At pages 6 and 7 of our advertising-sheet it will be seen that

Mr. Heard, of Boston, has purchased the right for New York and New England, and Messrs. Z. Locke & Co. the right for Pennsylvania and Camden, New Jersey. The latter firm, well known in this city, are now prepared to furnish this alcohol to all druggists, apothecaries, and perfumers. We have found it very pure.

FLUID EXTRACTS PREPARED IN VACUO.—We have just received from the Messrs. Tilden, of New Lebanon, New York, twenty-one samples of Fluid Extracts, as enumerated in their advertisement, to which they invite our attention. We can only acknowledge their reception, deferring any critical remarks in regard to them until our next.

NEW WORK ON PRACTICAL PHARMACY.—The attention of our readers is directed to the advertisement of Messrs. Blanchard & Lea on the next sheet, wherein it will be seen that they are about to publish a work on practical pharmacy, by Edward Parrish. This work, though more especially intended for medical men, is, we are informed, sufficiently wide in its scope to embrace much useful practical information for the apothecary, especially in reference to extemporaneous pharmacy.

HONOR TO THE DESERVING.—By an Imperial decree, dated the 13th of March, at the suggestion of the Minister of Public Instruction and Worship, the grade of officer in the Legion of Honor was conferred on M. Deville, (St. Claire) Professor of Chemistry in the Superior Normal School, who, by his discovery of the mode of producing aluminium in large masses, has conferred on manufacturing art the use of this valuable metal.

And also upon M. Woehler as the discoverer of aluminium, and as the first who made an organic animal substance, urea, altogether from mineral elements.

Memoirs of the Life and Scientific Researches of John Dalton, F. R. S.
By WILLIAM CHARLES HENRY, M. D., F. R. S., &c. London. Printed by the Cavendish Society. 1854. pp. 248, octavo.

The eminent services of Dalton to the science of chemistry renders the publication of his memoirs by the Cavendish Society particularly appropriate; and in Dr. Henry, the philosopher has a biographer every way qualified to do him justice. Born of Quaker parents at Eaglesfield in Cumberland, on the 15th of September, 1776, he derived his instruction at the village school until his eleventh year, soon after which he commenced the life of a tutor, and this continued to be his profession throughout his long career. In his fifteenth year he assisted his brother at Kendal, and continued for twelve years. During this period he commenced his meteorological observations, which afterwards led him to discoveries, in that science, of considerable importance. Subsequently his attention was turned to reflect on the ultimate constitution of matter, and he gave his leisure to chemical pur-

suits, and it was during the fifteen years following his departure from Kendal, (1793 to 1808) that his doctrine of the Atomic Theory, and his discovery of the law of multiple proportions were developed and introduced to the scientific world. The further development of these was the great work of his life, as they are the basis on which his fame as a philosopher chiefly rests.

Dalton's mental contour was the embodiment of patient, earnest, constantly operating thought. A subject once brought within his mental laboratory underwent a process of intellectual digestion until he had extracted from it all that his powers would admit. There was no hurry or confusion, no fear of being anticipated, but a steady contemplation of it in all the lights suggested to him by reflection. Dalton's *forte* was not in the exactitude of his experiments, so much as in his ability to draw inferences and make generalizations from the data they furnished. As an experimenter he was, as his biographer admits, by no means exact, having instruments faulty in construction, and incapable, even in more expert hands, of yielding reliable results; yet in spite of his defects as a manipulator, he was enabled, by his superior deductive powers, to make discoveries which have changed the whole aspect of chemical science. It was fortunate for Dalton's reputation as a discoverer that he was more given to reflecting on his own experiments than to looking after the researches of others, else he might have figured more as the developer of Richter's views than the advocate of his own. Seconded by such men as Thompson, Wollaston and Berzelius, Dalton's doctrine of multiple proportions in combination soon triumphed over the opposition which at first it met with; while his atomic theory, that which he evidently considered his greatest achievement, is becoming more and more probable in the progress of chemical science, although its very nature seems to place it beyond the possibility of direct demonstration. Had Dalton possessed the acuteness of Wollaston as a manipulator, and the accuracy of Berzelius as an analyst, he would have concentrated them with an untiring perseverance on the development of his views, and perhaps have extended yet further the bounds of chemical philosophy. We cannot do better for our readers than quote the following paragraphs from an essay on Dalton, by Mr. Joseph Ince, in the *Pharmaceutical Journal* :—

" But a little while ago, Manchester, in the midst of its roar of business, beheld a goodly spectacle of beautiful old age. A guileless citizen, with not one stray thought beyond Philosophy, was calmly working out his abstract reasonings, heedless of tall factories or sudden wealth. His home was in the laboratory, where he repaired every morning to light the fires and dust the pupils' desks; then, after a frugal breakfast, back again, ready and willing to commence his daily lectures. The spirit of worldly policy was not strong within him, for his instructions were given for the moderate sum of half a crown an hour, or eighteenpence when two attended. There sometimes he would busy himself in manufacturing an unfailing remedy for coughs and colds made with treacle, liquorice, and vinegar, explaining its sovereign virtues to an admiring audience.

No one could be more said to keep the even tenor of his way, for he dined at one, took tea at five, finishing the labors of the day at nine. This patriarchal existence was varied every Thursday by a game at bowls, which he pursued with an amusing ardor; but the main characteristic of the man was that transparent honesty, which made him as scrupulously exacting in his requirements from others as he was upright in his own conduct towards them. Thus he refused a certificate of attendance, until he had repeated in full the missing lecture for the applicant's sole advantage. Such traits of character, as well as his curious aversion to books and general literature, belong to the pleasant recollections of the past. Let us not, however led away by the prettiness of circumstance, for a moment lose sight of Dalton's real claim to honor, namely, his discoveries in science. A popular sketch necessarily shuts out the exhibition of those careful, minute, deeply-studied investigations, to which all original philosophers owe their reputation.

Those who wish to penetrate a little beneath the surface, cannot do better than consult the concise, intelligible Essay on the Atomic Theory, by Dr. Henry, given in the middle of the work. As Dalton's claim to priority of thought has been occasionally denied, it is well to see what were the views entertained on the subject previous to his time, how far he availed himself of the anticipations of others, and to what extent he may be credited with working out for himself the great doctrine on which his life was engaged.

Time was more favorable to Dalton than to another great mathematician—Hutton—who has recorded his opinion in his autobiography that it produces nothing but rage and children. The quiet Friend fared better in his generation; the Royal Society elected him a fellow, Oxford gave him her honors, Chantrey a statue, and the Government a pension, whilst his countrymen regarded him, even in his lifetime, as a sort of patron saint.

Now that the grave has claimed him he may rest in peace, without the fear of his reputation being snatched away by the spell of the euphonious name of Higgins.

A man who spent the energies of a whole career on the elucidation of one sole object could not be said to have *blundered* on the atomic theory, any more than the enthusiast who should walk on a pilgrimage from here to Manchester could be said to stumble on the high-road.

Self-taught, Dalton succeeded in spite of himself, for his philosophical instruments were of the rudest description, and his hands were not equal to his head; but for original, deep thought, united to a child-like simplicity, he will not soon be forgotten.

Dalton, like Sir Isaac Newton, (to whom he bore a strong mental and personal resemblance), disbelieved in genius, a misconception incident to real greatness, but one most readily pardoned in the case of those whose life is the best refutation of the theory. It is true indeed, that the marvellous influence of steady perseverance can be alone estimated by those who practice it, yet still there is a barrier which nothing but directing and creative power can pass.

Untiring industry will rescue the dullest mind from mediocrity; but there is an Excelsior which it cannot reach. Many a mountain shepherd has watched the changes of the atmosphere far more than Dalton, but unlike him, in vain; whilst many another inconsequent observer might have viewed the falling of an apple from the first one that tempted Eve, and been no wiser."

A report to the New York Academy of Medicine, on Solidified Milk, by the Standing Committee on Public Health and Legal Medicine. New York, 1855.

We have already given a brief account of the establishment of Mr. S. T. Blatchford, (see page 112) from the New York Med. Monthly, to which we refer our readers. The above report, by Prof. Griscom, Dr. Van Kleeck, and others, is entirely favorable to the success of the enterprise. The report says:

"Your committee have perhaps said all that is necessary to satisfy the Academy that the article before us is not only available as a *substitute* for milk, but that it is in fact *pure milk itself*, with the addition of sugar only. There is no loss of any nutritive material, a fact of which we can always be assured, for the article cannot be produced except from *fresh* milk, as any change in the character of the original fluid, either by spontaneous decomposition, or otherwise, must spoil the result."

As the Committee observe, there is every inducement on the part of the manufacturer, to use the richest milk in its preparation, as such yields the largest product. We quote the concluding remarks of the Committee, describing this substance and its capabilities as a substitute for milk:

"'Blatchford's Solidified Milk' comes to us mainly in the form of a tablet, covered with tin-foil. It has a light yellow, slightly mottled appearance, is of very firm texture, but yields readily to the knife or grater. Each tablet weighs a pound, and will make in solution five pints of rich milk. When pulverized, it is readily soluble in hot or tepid water, while cold water requires rather longer time, but the solution is perfect in either. The tepid solution approaches nearer the standard of natural milk. The only objection, besides that of the presence of sugar, which can be made to it is an empyreumatic flavor somewhat similar to that of boiled milk, which it receives in the process of manufacture. This varies in degree, but is much less distinct when the solution is made with cold than with hot water, and in the preparation of custards, puddings, arrow-root, wine whey, ice creams, &c., in all of which your committee have practically tested it, it disappears. To many persons this flavor is not objectionable, and with many others, the palate soon becomes reconciled to it, and in a short time fails to recognise it. By contemplated improvements in the apparatus for manufacturing it, this objection is expected to be entirely obviated.

"A solution in cold water, allowed to stand sufficiently long, will exhibit a surface of rich cream, much more abundant than is found in the same quantity of milk carefully selected in the city; from this cream your committee have caused good butter to be made, from which all traces of sugar are easily washed away, showing that this substance is only mechanically, and not chemically, incorporated with the milk constituents. In solution, it does not acidify so soon as the milk of city consumption.

"Besides the hard tablet, the solidified milk is also furnished in a granular form, inclosed in cans; it is thus more convenient for use, and will doubtless keep sweet for many months, though probably more liable to change than in the other form.

"With regard to the economy of its use for ordinary purposes in families, its cost (25 cents a pound) might appear to be a bar to its general introduction. But when it is considered that the milk thus made is much superior in quality to that commonly found in this city, and that the sugar it contains

renders necessary so much less of that substance in its application to various uses, to say nothing of the satisfaction derived from the assurance of its purity and healthfulness, the cost is quite balanced. But as an article of diet in sickness, considerations of economy become insignificant in comparison with purity and high nutritive character, and your committees deem it but a duty to their fellow practitioners, to call their attention to it, as a valuable adjunct in the sick room, especially in the convalescence of children."

An Investigation into the Facts and Theories of Fermentation and Putrefaction. By HENRY PEMBERTON, Practical and Analytical Chemist. Medical Examiner, for May, pp. 257-295.

We call the attention of our readers to the above essay, on one of the most obscure, and at the same time interesting subjects that appertains to chemistry on the one hand, and medicine on the other, entering as it does, so much in organic chemical reaction in disease, and in the cause of disease by miasmatic influence. We hope to be able to present our readers with the chief facts, brought forward by Mr. Pemberton, in our next number.

An Outline of Medical Chemistry for the use of Students. By B. HOWARD RAND, A.M., M.D., &c. Philadelphia, Lindsay & Blakiston. 1855. pp. 259; 12mo.

Chemistry has grown into proportions so extensive and complicate, that to get even within the threshold of the subject, the medical student is compelled to give so large a share of his attention, that all serious expectation of mastering its details, as presented in the more complete treatises of Graham, Kane, and others, during the distraction occasioned by the more (medically) prominent branches of anatomy, materia medica, and practice, is frequently abandoned. To meet this deficiency several smaller works have appeared, more or less extended as regards their grasp of the subject, and the little work of Dr. Rand belongs in the category. If we understand the author, his object has been to present the primary and important facts of chemistry, philosophical and material, in so condensed a form, and so stripped of complexity of details, that the student may get a correct outline *idea* of the subject, be conscious of the ground plan and leading points of the superstructure, so as to be able in his subsequent reading to intelligibly refer what he learns to its proper position, and not get confused. It is in fact to be an auxiliary of the lecturer, who is expected to fill up the details in his teachings.

Although much condensed, Dr. Rand's book embraces a large number of important facts in the chemistry of bodies used in medicine, organic and inorganic, and by the judicious use of symbolic formulæ, much exact information is conveyed. It will certainly find many admirers among the extensive class of persons to whom it is specially addressed.

THE
AMERICAN JOURNAL OF PHARMACY.

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SEPTEMBER, 1855.  
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NOTE ON NECTANDRA PUCHURY MAJOR AND MINOR, AS THE
SOURCE OF PICHURIM OIL AND PICHURIM BARK AND BEAN
OF COMMERCE.

BY J. CARSON, M. D. &c.

In the January number, 1851, of this Journal, is a paper entitled "On an Oleo Resin from Venezuela, by Wm. Procter, Jr.," giving an account of a peculiar product having characteristics as thus designated, and derived from South America. Within a few months, a specimen of the same fluid has been presented to me by Mr. Dulles, of the firm of Dulles, Earle & Cope, druggists, of this city, with specimens of the bark and fruit of the tree from which it is derived. Simultaneously with the reception of these specimens, I received through the kindness of Dr. Ruschenberger, U. S. N., the fruit of a tree inhabiting Brazil, labelled *Pichurim nuts*, and which have been determined to belong to the plant at first known as the *Laurus Pichurim*, but now placed in the genus at the head of this note. The fruit derived from both sources is the same, differing only in size. With this clue to the origin of the oily product described by Mr. Procter, it will be interesting to trace its Natural History, which will be done at some length in the present communication.

In the paper by Mr. Procter it is inquired, is this fluid identical with the "oil of laurel," or is it an analogous product? I am inclined to believe that it is the article referred to by Pereira under that name, for reasons to be given when speaking of the oil.

NECTANDRA *Puchury-Major*, Nees, *Laurin*. *Laurus Pichurim*, Richard, pere. *Ocotea Pichurim*, Kunth. *O. Puchury Major*, Martius. Nat. Ord. *Lauraceæ*.

GEN. CHAR.—Hermaphrodite. *Calyx*, 6-parted, rotate; segments deciduous, the three outer rather the broadest. *Anthers* 9, ovate nearly sessile, with four cells arranged in a curve, and distinct from the tip of the anther; cells of the interior anthers inverted. *Glands* in pairs, globose, sessile, at the base of the three interior stamens, next their back. *Sterile stamens* either tooth-shaped and biglandular at the base or eglandular, and then with a small oval head. *Fruit* succulent, more or less immersed in the tube of the calyx, changed into a truncated cap. *Flowers* paniced or corymbose, axillary, lax, pretty ample. Lindley.

Sp. Char.—Leaves oblong or elliptical, tapering to a narrow point, between papery and leathery, smooth, reticulated, of the same color on both sides. Peduncles axillary, short. Cup of the fruit very large and spongy.

This plant is described as being but little known to botanists, and we should think it probable, when Hancock is in doubt with regard to it, and Dr. Stenhouse supposed it to be a pine. Its history, however, has been clearly elucidated by Nees, in his *Laurinææ*. It is an inhabitant of Brazil, and probably other parts of South America, the localities referred to being Guiana, Paraguay and Venezuela, where either it or the next species may be found. The woods of Tabatinga, in the province of Rio Negro, are specified as producing it. The fruit in the early months of the year drop from these cups to the ground, when they are collected by the natives, cleaned of their flesh and pericarp and dried by a gentle heat.

N. Puchury minor, Nees. This species bears the smaller fruit. *Cotyledons of the Fruit*, *Pichurim Bean*, *Para Nut*, (*Sassafras Nuts*, Humboldt?)

The *Fruit* contains two cotyledons or lobes, which are convex on one side, flat or curved (from drying) on the other, of a deep brown color, probably reddish when fresh, having a strong aromatic odor, and a warm pungent taste. The substance is at first soft and greasy, but becoming hard from drying. With time, an efflorescence is formed upon the surfaces, supposed to be the solid matter of the essential oil contained in them. There are

two varieties of these lobes ; the larger, derived from Brazil, are one and a half inches in length, and over half an inch in breadth, tapering at the extremities so as to present an elliptical form ; the smaller are derived from Venezuela, and are scarcely an inch in length and two-eighths of an inch in breadth, of the same form but a little more tapering at the apex. It was at one time supposed that both these cotyledons belonged to the same species, and that the disparity in size depended upon difference in maturity ; they, however, as has been shown, belong to different varieties of the plant, if not species.

This fruit has been analyzed by M. Bonastre, and found to contain in 500 parts, 15 of concrete volatile oil, 50 of greasy buty-raceous oil, 110 of stearine, 15 of resin, 40 of brown coloring matter, 55 of fecula, 60 of soluble gum, 100 of parenchyma, with a little acid and uncrystallizable sugar.—*Journ. de Pharm.* xi. p. 1.

Bark.—The sample in my possession is in flat pieces of various sizes, from broken up fragments to half a foot in length and three to four inches in breadth ; in thickness, three or four lines. It is of a deep brown color, fibrous and brittle, possessed of the strong aromatic odor of the oil and a warm, biting taste. Where the epidermis is found upon the pieces, it is brown, furrowed or lichenoid.

Oil.—This answers to the description so well given by Mr. Procter in the paper referred to. My specimen is of a lighter color, which may be attributed to age, his sample having become somewhat resinified. The sp. gr. no doubt varies from the same change. I have stated that I had no doubt the above oil is the same described by Pereira as the "*Native Oil of Laurel.*" The latter is said to be "imported from Demerara, obtained by incision in the bark of a large tree, called by the Spaniards *Azcite de Sassafras*, growing in the vast forests between the Oranoco and the Parina." The label on the bottle in the possession of Mr. Procter recommends the "*Azcite de Sassafras.*" The description given of the oil by Pereira would apply to the article under consideration, and coming as they do from the countries which afford the plants treated of, and which have a wide spread habitat, we may reasonably conclude they are identical.*

*It is stated by the latter eminent pharmacologist that the oil is isomeric with the oil of turpentine.

In conclusion, it may be remarked that the bark has been used and recommended in South America as a febrifuge and aromatic tonic, and the nut is used as a substitute for the nutmeg. In fact, Lt. Herndon, in his "Exploration of the Valley of the Amazon," has given it as an article of commerce exported from the town of Barra on the Rio Negro, under the name of Puxiri, or Brazilian Nutmeg, an appellation found to apply in Rio de Janeiro by Dr. Ruschenberger. The oil may be found useful in rheumatism and in diseases requiring an aromatic stimulant.

EXAMINATION OF THE PREPARATIONS MADE BY THE
AMERICAN CHEMICAL INSTITUTE, NEW YORK.

By E. S. WAYNE, Cincinnati.

An association styled the American Chemical Institute, has recently been established in the city of New York, ostensibly for the purpose of manufacturing the concentrated remedies (resinoids and oleo-resins) so extensively used at present by the physicians of the Eclectic school, in their purity, and in a scientific manner.

This institution has produced an extensive list of the above mentioned remedies, differing in their appearance from those of any other manufacturer, and the process by which the chemists of this Institution have produced them, has not yet been made public.

They have also published a work entitled, "Positive Medical Agents, being a treatise on the New Alkaloid, Resinoid and Concentrated Preparations of Indigenous and Foreign Medicinal Plants," which treats of the therapeutic value of the above mentioned remedies, and contains clinic reports, showing the success which has attended their administration at their hands, and recommending to the profession the use of the remedies made by them as the most reliable of the kind, giving as reasons for this preference, that the most scientific methods are used in their extraction, and none but the most scientific chemists and pharmacutists engaged in their manufacture.

These preparations are so entirely different in their appearance, taste and odor from preparations of the same name, and from similar substances, made by others, that no little curiosity

has been excited in regard to their mode of manufacture ; and to throw some light upon the process, I have, at the request of Dr. Cleveland, made an examination of a sufficient number of them to judge *à priori* of the entire list produced at this institution.

The specimens examined I obtained from Dr. Cleveland, who procured them *direct from their establishment, and each specimen had upon it their label.* I also obtained specimens of their make from others ; they were all alike in appearance, and upon analysis gave the same results ; and all of them were, without any doubt, the products of the American Chemical Institute, of New York.

Analysis.

The first one of their preparations I submitted to analysis was Hyoscyamin ; it is said to be a resinoid in the work above mentioned ; it is of a dark green color, resembling chrome green in appearance, and possesses the peculiar narcotic odor of hyoscyamus ; the dose of it is said to be from one-twelfth to one-sixteenth of a grain. Twenty-five grains of this green powder were placed in a beaker glass, upon which one ounce of alcohol was poured, and the whole boiled for a few minutes. Upon removing from the sand bath, and allowing to stand to cool, I found that but a small portion had been taken up by the solvent ; it had become of a dark green color. The insoluble portion was separated upon a filter, and washed with hot alcohol as long as it took up any coloring matter. The insoluble matter upon the filter still retained a portion of coloring matter, it was of a pale green color. This was dried upon the filter, detached from it and weighed ; the weight of it was 21.25 grains ; it was insoluble in water ; upon the addition of sulphuric acid it readily dissolves without the application of heat, with the disengagement of carbonic acid gas, and a precipitation of the remaining trace of coloring matter which was separated from the solution by filtering it. A portion of the solution in a test tube was treated with phosphate of soda ; no change was produced in the solution. The addition of a few drops of aqua ammonia caused an immediate white, bulky precipitate, indicating the presence of magnesia. The deep green filtrate obtained by treating the hyoscyamin with alcohol, was evaporated to get rid of the alcohol, a small quantity

of water having been previously added to it; the loss of alcohol caused a separation of a dark green fatty substance, chlorophyl. A few drops of dilute sulphuric acid were now added to it, and boiled and filtered to separate the insoluble green matter, and (having detected one fraud, suspected another) examined it for the presence of morphia, without obtaining any indication of its being present.

The analysis of this substance proves it to be, not as it is represented, a resinous product, obtained from the *Hyoscyamus niger*, but to be carbonate of magnesia, upon which tincture of hyoscyamus has been poured, the alcohol evaporated, and the resulting mass reduced to a powder, the bright green color of which is due to the chlorophyl taken up from the leaves by the alcohol. It contains little or no resin, the fatty greenish substance chlorophyl alone being separated upon the evaporation of the tincture obtained in the first experiment.

Hydrastin.—This substance is in the form of a powder, of a yellow color, and like the former is said to be a resin, obtained from the *Hydrastis Canadensis*. It was treated like the hyoscyamin, and found to contain 20.25 grains of carbonate of magnesia out of 25 grains used in the experiment. The alcoholic tincture obtained was evaporated so as to expel the greater portion of the alcohol, a small portion of resin separated, which was removed by filtration; to the filtrate a few drops of hydrochloric acid was added, which precipitated in crystalline form the hydrastine, which was dried, and weighed 1.25 grains.

This resinoid, like the former, the analysis proves to be nothing more than carbonate of magnesia, upon which tincture of hydrastis has been poured, the alcohol allowed to evaporate, and the mass then powdered.

Gelsemin.—Said to be the resinoid of the *Gelsemium semper-virens*. It was treated as the two former substances, and proved to be like them, carbonate of magnesia, upon which a tincture had been poured. I presume it must have been the tincture gelseminum, because the tincture obtained by digesting the powder in alcohol, exhibits the same peculiar bluish tint by reflected light, observed in the tincture of the root of that plant. The weight of carb. magnesia obtained from 25 grains was 21.25 grains.

Ten other resinoids I have examined, and with the same comparative results, the only difference being a slight variation in the amount of carb. magnesia found. I have examined in all eighteen specimens of the products of the American Chemical Institute, called resinoids and alkaloids, and have found but four specimens to be as represented, namely, jalapin, which is the true resin of jalap, powdered; podophyllin, the resin of the *Podophyllum peltatum*; sanguinarin, from the *Sanguinaria Canadensis*; and hydrastine, a crystallizable principle obtained from the *Hydrastis Canadensis*. As they prepare it, it is of a dark yellow color, and in the form of a powder. I found it to be perfectly soluble in hot alcohol, from which it crystallized in stellated groups upon cooling. This substance they claim to be an alkaloid, but it is really an indifferent body, without either alkaline or acid properties, in that respect similar to piperin and salicin.

The result of my analysis of their preparations is so much at variance with the high tone which this Association assume, and their boast of superior chemical and pharmaceutical lore, that I deemed it, in justice to them, to be positive that the preparations I examined were as represented, true specimens of their manufacture; and also, that the plea of their not being genuine could not be set up against my analysis of them, or maintained, if perchance it should be.

And it must be evident, from my examination of them, that the work previously mentioned is intended as an advertisement, to extend the sale of these products; and as it is plausibly written, and assumes an air of great sincerity, it is very apt to blind with many the true object in view. It is written also with another object; to lull suspicion, and prevent, if possible, an investigation of the true nature and composition of the remedies they manufacture.

Cincinnati, June 8, 1855.

ON OINTMENT AND EXTRACT OF STRAMONIUM.

By A. P. SHARP, Baltimore.

In the U. S. Pharmacopœia for 1850, the formula for the preparation of stramonium ointment was changed from the

method by infusion, to that of a mechanical mixture of the extract with lard, so that the resulting preparation varies in color and consistence with the form of extract used. When the extract of the Pharmacopœia is employed, the color is brown; when the extracts containing chlorophylle and albumen are used, the color has various shades of a dull green. As some may continue to prepare it in the old way, I will give the following method, which I have adopted for some years, and which affords an excellent result.

Take of Fresh Stramonium leaves,	a pound.
Lard,	three pounds.
Yellow wax,	half a pound.

Put three ounces of the stramonium leaves bruised with half a pint of alcohol of 88 per cent., mix them with the hand, and when the coloring matter has been dissolved express the tincture, add the dregs and the remaining leaves bruised to the lard, and heat them until they become crisp, avoiding too high a temperature. The exhausted leaves are then separated by a cloth and strongly expressed; the wax is then incorporated by heat, and the tincture added, continuing the heat until the alcohol is driven off and the chlorophylle, &c. remains dissolved in the fatty matter, to which it gives a fine green color. Made in this way the ointment is not prone to rancidity, and may be kept for two years perfectly sweet and green.

In preparing the extract I pursue an analogous plan. A portion (one fourth) of the bruised leaves is mixed with strong alcohol, and after standing several days is expressed. The remainder of the leaves mixed with sufficient diluted alcohol (1 to 4 of water) to cover them are allowed to stand several days and expressed. The alcoholic juice is now evaporated by a water bath, and when nearly of the proper consistence the first made green tincture is added and evaporated. The extract now has a fine green color, and when used for making the ointment by the present officinal process it affords a preparation of a bright green color, especially if a little alcohol is mixed with the extract before adding the lard.

In preparing the extracts of aconite, belladonna and hyoscyamus, I pursue the same plan, using the finest imported dried leaves and a larger quantity of diluted alcohol. These extracts

keep well, owing to the absence of albumen, and are, with the exception of their fine green color, equivalents of the alcoholic narcotic extracts of the *Pharmacopœia*.

In the preparation of the extracts of rhubarb and gentian I have found a decided advantage from treating the roots in pieces of the size of shell-barks, digesting in weak alcohol for some days, expressing, filtering, and evaporating. Too much care cannot be given by the apothecary to the quality of all these preparations, and when able he should make them himself. I once heard a druggist say that he had obtained as much extract of *hyoscyamus* as he had taken of herb, and he seemed to think it a wonderful feat. He boiled the leaves in water for half a day, transferred them to a coarse bag or cork sack, and expressed them forcibly, so that much vegetable pulp was separated with the decoction and remained in the extract.*

Baltimore, July, 1855.

CONVERSION OF CANE SUGAR INTO GRAPE SUGAR, OBSERVED
IN THE SYRUP OF IODIDE OF IRON AND SYRUP OF PROTO
NITRATE OF IRON.

By E. S. WAYNE.

My attention was attracted, recently, by a singular change which had taken place in a portion of syrup of iodide of iron made by myself, (in accordance with the formula of the U. S. P.) I had made in all about twenty pounds of the syrup, which, for convenience and protection, was put up in glass stoppered bottles, containing each one pound; these were wrapped in paper and placed in a cool location. A few months after it was made, I accidentally removed the wrapper from one of the remaining bottles, and, to my surprise, found that nearly the whole of its contents were in a semi-solid condition, only about half an inch of fluid remaining, and resting upon the solid portion. I then examined the remaining bottles of syrup, and to my astonishment, found that they had undergone no corresponding change.

From the appearance of the solid contents of the bottle thus

[* NOTE.--Eugene Dupuy (vol. 24, page 219, July 1852,) gives a formula analogous to the above in using alcohol, but directs the leaves to be dry and treated in powder with the alcohol.—EDITOR AM. JOUR. PHARM.]

changed, it not presenting any distinct crystalline form, but granular in appearance, I suspected a modification of the sugar into grape sugar had taken place; and with the view of ascertaining if such was the case, I removed a portion of the mass from the bottle, and pressed it in a cloth to remove as much as possible the fluid portion. The mass left I dissolved in water, and to the solution added sesquicarbonate of ammonia to remove the iron. The precipitate was removed by filtration, to the filtrate Donaldson's test was added, and the whole heated to ebullition. A precipitate of the red suboxide of copper was immediately produced, indicating the presence of grape sugar. The appearance of the mass, and the above reaction of the test applied, was so conclusive to me of the presence of grape sugar, that I deemed any farther test unnecessary. This change of ordinary cane sugar into grape sugar in the syrup of iodide of iron is to me inexplicable. Professor Procter, to whom I mentioned the fact, suggests the presence of free hydriodic acid in the syrup, as the cause of the alteration. There certainly was not any free acid in the original syrup; if so, why not the whole of it undergo the same change? it was all made at the same time and equally protected from the air. The fluid floating upon the solid mass was of a darker color than the original preparation; free hydriodic acid might have been present in it; I did not examine it for it.

Since I have observed this change in the above preparation, Dr. Chapman, of this city, to whom I mentioned it, stated that he had observed a similar phenomenon to occur in the syrup of proto-nitrate of iron, a quantity of which he had carefully prepared some time since, and put up in phials holding two ounces each. Some of the bottles of syrup commenced to deposit a granular substance; others evinced no disposition to change.

One of the bottles of syrup thus changed was given me for examination, which I tested in the same manner as the syrup of iodide of iron, and with like results. The presence of free acid in this last preparation might, in fact, be the cause; but the singularity of the change taking place in a portion only of it, as in the former, I think requires some other explanation.

In the July number of the London Pharmaceutical Journal, I find mention of a curious fact discovered by E. Maumene, which, perhaps, explains the reaction in these two preparations. He

has found that a solution of cane sugar kept for some time, experiences the same conversion into uncrystallizable sugar as when heated with acids. The sugar in these two preparations was exactly in a condition to undergo this change in solution, and had been kept for some time, and at the commencement no free acid was present, but by the metamorphosis free acid was probably generated and accelerated the change. To obviate this difficulty in the above and like preparations, I would suggest the propriety of using grape sugar as a protective agent; it could be easily made from starch, and would be as economical, and not change or deposit by the action of acids as cane sugar will.

Cincinnati, August, 1855.

EXAMINATION OF THE SULPHATE OF QUINIA OF MESSRS.
POWERS & WEIGHTMAN, OF PHILADELPHIA.

BY EDWARD R. SQUIBB, M. D., U. S. NAVY.

Assistant Director U. S. Naval Laboratory, New York.

MR. WM. PROCTER, JR.

Dear Sir:—In the last number of the Journal there appears by the side of my paper on citrate of iron and quinia, a note to you from Messrs. Powers & Weightman, characterizing a part, at least, of that paper as inaccurate. Now my remarks upon their sulphate of quinia did not pretend to more than the accuracy of ordinary practical pharmacy; and the aim was to attain constancy and certainty in connection with the subject of the paper, and to forestall any inferences as to whose sulphate of quinia it was that gave so short a yield. The amount (10 per cent.) of uncombined water stated to be in this sulphate, I now know to be technically incorrect. But it was judged of by the loss in partially efflorescing at 212° , in comparison with the statements of the majority of authorities at hand, and by an inference of its purity. This latter inference was also both technically and practically incorrect.

The pecuniary sensibilities of the manufacturers appear to have led them to receive these remarks upon their preparation as a critical analysis, and they contradict the results, and substitute for them others, which, as chemical analyses, to establish the

chemical perfection of the salt, are even less accurate than the statements they propose to correct.

In view of this unqualified contradiction of my remarks, I have been obliged, reluctantly, to take the time and trouble of another more accurate examination of the sulphate of quinia in question, in order that the character or business of the manufacturers may not suffer through any looseness of expression or inaccuracy of mine; and in order to repel the charge in the sense in which it appears to have been made.

I therefore beg the favor of an insertion of the following paper in the Journal; and that you will send a proof impression of it, at your earliest convenience, to Messrs. Powers & Weightman.

Very respectfully, your obed't. serv't,

E. R. SQUIBB.

This series of experiments embraces the examination of fifteen bottles of this commercial sulphate of quinia, taken without selection from a shelf upon which some forty or fifty bottles still remain.

Experiment No. 1.

The contents of 14 bottles gave an average or mean weight of 434.531 grains each, or .678 per cent. short of the avoirdupois ounce. From the looseness of some of the corks, and from having noticed that 8 bottles in standing over night with the tin foil cover and some of the wax removed, but with the corks undisturbed, very sensibly lost weight, it is probable that these bottles contained an average avoirdupois ounce when put up, and that this deficiency is a loss of water by evaporation. They are, therefore, assumed to have contained an average of 437.5 grains, and this is taken as the basis of all the calculations.

The weather during the first three days of the following observations was clear and very warm. Afterwards cooler, and generally rainy or very damp.

After 24 hours exposure to ordinary summer air, and temperatures from 76° to 92°, the fourteen ounces were found to have suffered a mean loss of 45.02 grains each.

Exposed thus for nine consecutive days the lowest mean weight was 391.18 grains, and the greatest mean loss 46.32 grains each or 10.587 per cent.

Subjected then to a dry heat of 180° to 212° in a steam kettle, for sixteen hours, they suffered an additional mean loss of 19.04 grains.

Exposed again at ordinary temperatures for twenty-four hours the mean weight arose to 391.5 grains.

This alternate heating and exposure was repeated a second and third time with similar results. The greatest mean loss being 19.8 grains per ounce, or an additional loss upon the 391.18 grains of 5.06 per cent. The entire loss upon the fourteen ounces heated to 212° was 66.12 grains each, or 15.11 per cent.

The salt finally exposed during a very rainy night and morning regained a mean of 392.19 grains, when, after mixing the whole fourteen ounces very thoroughly together, the salt was restored to the bottles, putting up only about $12\frac{1}{2}$ scant avoirdupois ounces of the salt as it is usually dispensed and administered. The half bottle was reserved for the after experiments, and marked impure sulphate, effloresced.

In the following experiments it became necessary to use a more delicate balance, and the French decimal weights. The avoirdupois ounce should, by calculation, be equal to 28.3465 grammes; but, in practice, with our balance and weights it is equal to 28.4856 gram., and this latter is therefore taken as the basis of the calculations.

The authoritative composition of the officinal disulphate of quinia is as follows:

2 eqs. Qn	= 324	= 74.31	per cent.	= 21.1682	gram.	or	325.115	grs.	per oz.
1 eq. SO_2	= 40	= 9.17	"	= 2.6133	"	or	46.137	"	"
8 eqs. HO	= 72	= 16.51	"	= 4.7040	"	or	72.247	"	"
	<u>436</u>	<u>99.99</u>		<u>28.4855</u>			<u>437.499</u>		

Experiment No. 2.

The contents of a new bottle of the commercial salt was taken and found to weigh 28.5050 gram., but assumed at 28.4856 gram.

This dissolved very easily in 28.5 times its weight of boiling distilled water. This solution was boiled in a flask till the proportion of water was reduced to 23.96 times the weight of the salt, and the boiling point arose to 216° . After being removed from the flame, it remained perfectly free from any appearance

of crystallization until the temperature had fallen below 205° ; and the temperature fell to 200° before general rapid crystallization was fairly established in the solution. This crystallization seemed complete in four or five hours, but the flask was exposed at ordinary temperatures for nineteen hours, and then for seven hours was kept at temperatures between 55° and 65° by means of iced water. The mother water was then quickly separated and set aside for examination; and the crystals washed in a filter, drained, dried and effloresced at 212° , and weighed. The washings were then evaporated to dryness and the residue weighed.

These, with the calculated quantity of $2\dot{Q}n, SO_3, + 8HO$, in the mother liquor, (1 part to every 740 parts,) = .9223 gram., when added together and corrected for the loss by efflorescing, give a total net yield of 25.8069 gram. of $2\dot{Q}n, SO_3, + 8HO$, for this ounce of commercial salt, indicative of a loss of 11.123 per cent. The loss by efflorescing is calculated upon Exper. No. 1., and the residue of the washings is assumed to be all disulphate of quinia and water. The first crop of crystals of this experiment are assumed to be the pure officinal salt, and are to be used in the following experiments as pure effloresced sulphate.

Experiment No. 3.

Similar quantities of the pure and impure effloresced sulphates were placed side by side in a box of bibulous paper, and allowed to stand exposed to the ordinary atmosphere for sixteen hours. They were then heated for two hours at temperatures from 200° to 218° , and again exposed at ordinary temperatures for twenty hours, at the end of which time they were assumed to have attained a corresponding condition of hydration, as far as the disulphate of quinia was concerned. From each of these salts 10 grams. was weighed into separate capsules, and the capsules and contents were subjected to the same steam heat, at the same time, for eight hours—five hours at temperatures varying between 220° and 236° —and three hours at a steadily-maintained temperature of 242° , without any appearance of fusing in either. They were then placed under a bell glass, over sulphuric acid, for fourteen hours, and weighed. The pure salt had lost .4577 gram., or 4.577 per cent.; whilst the impure

salt had lost .5481 gram., or 5.481 per cent. Then exposed to the ordinary atmosphere for five hours, the pure salt regained its original weight within .0029 gram., while the impure salt was still .0461 gram. short.

This experiment terminates those in which drying was resorted to in order directly to estimate the amount of water present; and the concise result is that

Dried by exposure at ordinary temperatures, the salt loses				10.587 p. c.
do.	do.	212°	do.	15.11 p. c.
do.	do.	242°	do.	15.223 p. c.

Now if this salt was pure disulphate of quinia, as it is not; and if the final heating had perfectly effloresced it,—which is not probable, as the salt did not fuse—it should still have contained 2 eqs. or 4.128 per cent of its water of crystallization. But in drying it had lost within 1.29 per cent. of all the water it should have contained as the chemically perfect salt represented by the analysis of the manufacturers.

Dr. Wood, (Dispensatory, 10th edition, p. 1172), Pereira, (Materia Medica, Am. ed., vol. 2, p. 694), and Brande, (Manual Chem. vol. 2, p. 1436) agree that the crystals in efflorescing lose one-half their water of crystallization. But if we double the loss this salt suffers at 212°, it would indicate a loss which I now know to be incorrect.

These authorities (all I have at hand that are definite upon the character of the officinal salt,) all quote Soubeiran in brackets, or Liebig, as giving the loss by efflorescing, at 6 eqs. or three-fourths of the water of crystallization; and this latter is probably the true loss of a pure salt that has been fused. Brande, (op. cit. p. 1435), says the pure salt, heated to 212°, should lose only 8 to 10 per cent. in weight, and I believe this test, as a standard, is better expressed thus than by the U. S. and London Pharmacopœias. In my single comparative experiment with what may be considered a pure disulphate of quinia, it held 4.57 or probably 4.59 per cent. of water above the 2 eqs., or 4.128 per cent., at ordinary temperatures; and after being heated to 242° regained its full weight, within a mere fraction, in five hours.

These deductions from the results of the foregoing experiments are, however, very much confused by the results that follow:

Experiment No. 4.

From the impure effloresced sulphate used in No. 3, two portions of 5 grams. each were weighed off, and marked A and B. Portion A was placed in a beaker, and 200 gram., or about 7 f.3. of distilled water, acidulated with 14 drops of concentrated sulphuric acid, was poured upon it, and the whole stirred till solution was effected.

To a similar quantity of water in another beaker, double the quantity of sulphuric acid was added, and this dilute acid was then carefully saturated from a measured quantity of solution of soda, s. p. 1.068, and the quantity thus used was noted as 5 f.3. From the same solution of soda 5½ f.3. was then measured off and thrown at once into the quinia solution, and the whole actively stirred for five minutes. The beaker was then covered, and allowed to stand five hours. This standing is very necessary, for during this time the precipitate slowly contracts, and forces out minute quantities of undecomposed sulphate, which otherwise would render the filtered mother liquor milky after, or during its separation from the precipitate. The precipitate also becomes granular, and much more easily managed without loss.

The supernatant liquor was then passed through a dried and weighed filter of Swedish paper, and then the precipitate was thrown into the filter and washed till the washings gave no reaction with solution of chloride of barium. The drained precipitate was then carefully transferred to a weighed capsule, and the filter returned to the funnel for farther use.

The 7 f.3 of mother liquor, and 2 f.3 of washings, were then evaporated together to about 3 f.3, and the whole residue collected upon the filter and washed with distilled water till the residuary liquor amounted to about 7 f.3. The amount of colored precipitate thus obtained, when dried and fused, was .1252 gram. or about 3.07 per cent. of the whole. The residuary liquor was very slightly bitter, and probably contained an inappreciable portion of the precipitate. The residue from the washings in a weighed watch glass, and the precipitate in the capsule were placed in an air bath and heated till they fused completely, when they were transferred to the bell glass over sulphuric acid. The filter was then dried precisely as before being used, and also

placed under the bell glass to cool. In three hours the whole were put upon the balance and weighed. The net yield of fused precipitate was 4.0702 gram.

Experiment No. 5.

Portion B, of the last experiment, was dissolved in fifty grains of distilled water, acidulated with 18 drops of hydrochloric acid. In connection with this solution, it is, perhaps, worth while to mention a convenient method for removing insoluble particles, that are frequently found in such solutions, without the trouble and loss of filtration. The solution was stirred around until it was in a rapid whirl, and the glass stirring rod removed and rinsed off into the solution with a few drops of distilled water from the wash bottle, and the square ground end carefully dried. A small pellet of wax, weighing .1562 gram., was then made to adhere to the dry flat end of the rod, in the form of a flattened sphere. On examining the solution then, the whirling motion was found to have nearly ceased, and the particles all collected into a little hillock in the centre of the beaker. The armed stirring rod was then carefully passed straight down upon the particles, with a force just sufficient to imbed them in the wax, and then removed and again rinsed off into the solution with a few drops of water. The wax pellet, containing the particles, was then carefully removed, dried, and replaced in the balance; and enough of the original salt was placed upon the .1 gram. platinum weight of the opposite pan, to restore the equipoise. This salt was then washed off into the solution and dissolved.

Solution of chloride of barium was then added in excess, and the whole allowed to stand closely covered, for twenty-four hours. The supernatant liquor was then drawn off by a pipette, and replaced by distilled water, when the whole was well stirred and again allowed to stand twenty-four hours and decanted. Duplicate filters, about 2½ inches in diameter, were then cut of exactly the same size, from the same piece of paper, and upon one of these the precipitate was collected, washed with 50 gram. of water and drained. The empty duplicate filter was then perfectly burned in a weighed crucible, cooled over sulphuric acid, and then found to yield .0014 gram. of ash. The filter and pre-

precipitate were then added to this ash in the crucible, and the whole was well ignited, cooled over sulphuric acid and weighed. The net yield of BaO , SO_3 , was 1.4686 gram.

Then, as $116.7 = \text{eq. of BaO}$, $\text{SO}_3 : 40 = \text{eq. of SO}_3$, :: 1.4686 gram. BaO , SO_3 , : .5033 gram. SO_3 = the amount of acid obtained.

Then 4.0702 gram. of base + .5033 gram. of acid, = 4.5735 gram., which leaves .4265 gram. as the quantity of water. held by the 5 gram. of effloresced commercial salt, or 8.53 per cent. But the acid and base are not in the equivalent proportions for disulphate of quinia, the acid being .178 per cent. in excess. Showing either free acid, a portion of neutral salt of quinia, or some foreign base of higher saturating power.

Experiment No. 6.

The same quantities of the pure effloresced sulphate, as in experiment No. 4, were weighed off at the same time, and marked C and D. Portion C was treated precisely like portion A, in every practicable respect, and yielded a net fused precipitate of 4.2536 gram., or 4.506 per cent. more of base.

Experiment No. 7.

Portion D was treated precisely like portion B in every practicable respect, and yielded a net ignited precipitate of 1.4706 gram. BaO , SO_3 = .50406 gram. SO_3 = the amount obtained.

Then 4.2536 gram. of base + .50406 gram. of acid = 4.75766 gram. as the yield obtained from 5. gram. of the salt, leaving only .24234 gram., or 4.847 per cent. of water, present in this effloresced salt. But on being heated to 242° without having fused, this very identical 10 gram. of salt lost 4.577 per cent. of its weight; and this would indicate that when thus heated it could have contained only .27 per cent. of water of crystallization.

The acid and base are not in the equivalent proportion for disulphate of quinia; but instead of there being an excess of acid, as in Experiments No. 4 and 5, there is here an excess of base, or, in other words, a deficiency of acid of .4025 per cent.

In obtaining these results every known source of error was avoided; and they were all verified by repetition, but by the same method of proceeding. The time necessary for further research to elucidate the discrepancies, is not at present at my

command; but I hoped to have brought the subject into a light sufficiently interesting and important to induce some one, better qualified, to take up and pursue the subject.

Experiment No. 8.

The reserved mother liquor of Experiment No. 2 weighed 682.5475 gram., and contained, according to the following equation, based upon the solubility of the disulphate of quinia, .9223 gram. of that salt. For as $740 : 1 :: 682.5475 \text{ gram.} : .92236 \text{ gram.}$ This mother liquor was evaporated to one-eighth its bulk, or till crystals began to form on the surface of the hot liquor, and was then set aside to crystallize. These crystals, when washed, dried, effloresced at 212° and cooled, weighed 1.6356 gram. As these crystals must have contained nearly all the disulphate of quinia that remained in the mother liquor, it is requisite to subtract the .9223 gram. less 8.8 per cent., equal to .8412 gram. of effloresced disulphate from their weight. This leaves the brown crystalline impurity at .7944 gram. The remaining mother liquor and washings were then evaporated together to dryness, and heated for some hours at 218° . The red brown amorphous residue then weighed .7528 gram. Thus the total impurity of a saline and amorphous character contained in one ounce of the commercial salt is represented by the following formula:

$$.7944 + .7528 = 1.5472 \text{ gram., or } 6.074 \text{ per cent.}$$

Experiment No. 9.

From the effloresced crystalline impurity of the mother liquor, from Experiment No. 8, two portions of .7 gram. each were weighed off at the same time, and marked E and F.

Portion E was dissolved in water acidulated with sulphuric acid, precipitated by solution of soda, and the precipitate washed, dried and fused, when it weighed .4837 gram.

Portion F was dissolved in water acidulated with hydrochloric acid, precipitated with solution of chloride of barium; and the precipitate when washed, dried and ignited, yielded .0662 gram. of SO_3 .

The combined weight of this acid and base subtracted from the weight of the effloresced salt used, leaves .1501 gram., or

21.44 per cent. of water of crystallization present, and the percentage composition of the salt appears to be as follows :

Base	-	-	69.1	per cent.
SO ₃	-	-	9.457	"
HO	-	-	21.442	" by deduction.
<hr/>				
				99.999

Hence it follows as a deduction, that the base cannot be quinia alone, unless it was in the form of neutral sulphate.

The red brown amorphous matter I have not examined, except to determine by chlorine, water and ammonia that there was only a trace of quinia in it.

These, then, are the experiments and results of the examination as far as I have time to carry them out; and I am sorry that other occupations prevent me from pursuing so important and interesting a subject to something like completion. The deductions from these results I leave to those who read and examine them, merely remarking that the experiments were prosecuted far enough to make it quite clear to my mind, that although there is not 10 per cent., nor perhaps even quite 5 per cent., of uncombined water in this commercial salt, there is more than 10 per cent. of water and other impurities, two-thirds of which, at least, might and should be avoided in the manufacture of medicinal preparations.

Naval Laboratory, New York, Aug. 8th, 1855.

LETTER FROM MESSRS. POWERS AND WEIGHTMAN RELATIVE TO THEIR SULPHATE OF QUINIA.

MR. W. PROCTER, JR.

Dear Sir,—Though the politeness of Dr. Squibb we are again put in possession of the proof sheets of a communication by him, in reply to a note of ours in the last number of the Journal, on the subject of sulphate of quinia. Our former communication was necessarily brief, and the results of our experiments therein detailed were not numerous, nor were they conducted through any protracted period, and might not therefore be looked upon as conclusive as those detailed by the Doctor.

Since then, however, we have had more experiments made on

the same subject, and with the same results, which will be alluded to hereafter.

Dr. Squibb's inference, in his first communication, is based principally upon a larger loss of the sulphate in drying within certain points of temperature, than is stated by some authors, which he now acknowledges to have been practically and technically incorrect. His remarks upon our pecuniary sensibilities might have been correct, had no other issues been involved, and his concluding remark in the same paragraph we cannot think sustained by his subsequent experiments. Our experiments, which he seems now to think "are even less accurate than the statements they propose to correct," have been verified by repetition, and still further extended by additional ones, and we see no reason to change the inferences then made.

We have assumed the statement of Soubeiran, quoted in brackets by Dr. Wood, to be correct, and Liebig agrees in the same calculation, that sulphate of quinia loses six atoms of its water of crystallization by exposure to warm dry air; this was the result of our experiments. We can see no inaccuracy in this. If, however, we assume the loss to be only four atoms by exposure, as is stated by Dr. Wood, quoting from Philips, then Dr. Squibb's assertion may be correct. Of the eight atoms of water of crystallization, most authors consider two as being retained at any temperature short of fusion and decomposition. Dr. Squibb has again been led to infer from this that there is still more water in combination with our sulphate than ought to be. Our recent experiments have led us to think differently. Which of the two are right, others must determine.

In drying either sulphate of quinia or the alkaloid, much depends upon how it is subjected to the action of heat, whether exposed with a large surface to a heated dry atmosphere, or whether enveloped in paper, or in a capsule on a hot surface, heated by steam or otherwise. In the latter case, but a small point of the capsule comes in contact with the heated surface, rarely heating the material to be dried to the same temperature; and if it is thick, rendering a prolonged exposure with much stirring necessary to bring all the particles in contact with the hot point. May not some of the differences of authors be owing to the different modes of ascertaining the loss in drying?

Prolonged exposure at a lower temperature will produce the same loss in sulphate of quinia, as one of shorter duration of a higher temperature, and *nearly the whole of the water of crystallization may be driven off at a temperature short of fusion.* This we think will satisfactorily account for Dr. Squibb's loss of 15.11 per cent., and it is only to be regretted that the Dr. did not push his experiments still further, to ascertain whether the two atoms of water which he calculates as still remaining in combination, were really there. The results of our experiments are as follows :

No. 1. 100 gra. sulphate of quinia exposed to the air at a temperature varying from 70° to 90° for 4 days, lost									
								11 gra.	= 11 p. c.
" 2.	300 gra.	exposed to an atmosphere heated to 160°,	24 hours	lost	33 gra.	=	11 "		
" 3.	300 "	" "	"	180	1 "	"	33 "	=	11 "
" 4.	the same	" "	"	180	6 "	"	38 "	=	12.66
" 5.	100 gra.	" "	"	170	24 "	"	11 "	=	11 p. c.
" 6.	the same	" "	"	170	40 "	"	12.4 "	=	12.4
" 7.	"	" "	"	170	7 days,	"	15.5 "	=	15.5
and then ceases to lose,									
" 8.	66 gra.	exposed in a capsule in an oil bath heated to 300°	1 hour	10.3	"	=	15.6		
" 9.	the same	heated to fusion in the same bath,			10.7	"	=	16.3	

It is evident from the above, that the loss of water is by no means as definite as is generally stated; but that temperature, as well as its continuance, will produce results which may make any assertion of loss within these limits right or wrong.

The latter part of the Dr's. remarks, about there being other bases in combination in the mother liquor, are to us very indefinite. That he failed to obtain the same quantity of crystallized or effloresced sulphate as that originally employed, is to us not surprising, when the influence of heat in changing proximate principles is considered, and our only wonder is that he got as much as he did.

Pasteur describes two new alkaloids, derivatives from quinia and cinchonia, obtained by the action of heat, and every manufacturer who knows how readily these changes take place, learns, practically, the necessity of avoiding prolonged heating and torturing.

In conclusion, while we make no claim of absolute chemical purity for our preparations, yet we consider the existence of a trace of the usual impurities from which each preparation has been made, to be no indication of adulteration; and we do claim for them a degree of medicinal purity, comparing favorably with the productions of manufacturers of this and other nations.

This is the first time we have thought it necessary to step out of our usual business, thus to defend any of our preparations; and, in this case, nothing but the position occupied by Dr. Squibb, the errors of his communications, some of which are already acknowledged, and the marked manner in which we have been singled out, have induced us to do so.

Very respectfully, yours,

POWERS & WEIGHTMAN.*

August 13th, 1855.

ON THE SO-CALLED CREAM SYRUPS FOR MINERAL WATER.

By THE EDITOR.

The "mineral water" season in this city opened with a new class of syrups, which have received the generic title of "Cream;" from the fact that the original recipe required that substance as the basis in their preparation. The origination of these syrups is attributed to Mr. C. Augustus Smith, formerly of Cincinnati. Their introduction into this city belongs to Mr. Alfred B. Taylor, who, without being aware of their use in Cincinnati, originated the following formula, which he has kindly communicated for publication, at our request.

Take of Good cream,

New milk, of each, two pints,

Sugar in powder, four pounds, (Avoir.)

Mix the cream and milk, add to them the sugar, and dissolve without heat, by stirring; or better, on a funnel by displacement. This is the lactescent basis from which the several flavored syrups are made, and is never used alone. The most popular of the compound cream syrups is that called "Vanilla Cream," which Mr. Taylor makes as follows:

Take of Strong fluid extract of Vanilla, (3j. to 3iv.) 3 fluid drs.

Simple syrup,

Cream syrup, of each, one pint.

Mix.

For strawberry, raspberry and pine-apple cream, mix equal bulks of the respective syrups with the simple cream syrup.

The chief objection to the use of cream syrup is its want of permanence. It should, during the weather in which it is most

* See editorial, page 478..

employed, be made freshly every day, or, at least, every other day; yet if the proper precautions are taken to keep it in ice it may be kept for a week.

In a conversation with Mr. O. S. Hubbell, (of 12th and Chestnut sts.,) whose familiarity with all that relates to syrup making and mineral waters is well known, he kindly offered to give us information, and since has communicated the following:

MR. WM. PROCTER, JR.

My Dear Sir:—The idea of cream syrups is due to our friend Mr. C. A. Smith, who employed them many years ago in Cincinnati. In addition to their luscious flavor, they contain so many elements of the bodily constitution, that they constitute no unimportant addition to our list of popular and wholesome drinks. Out of the casein are formed the albumen and fibrin of the blood, and the proteinaceous and gelatinous tissues. The butter serves for the formation of fats, and contributes, with sugar, to support the animal heat, while the cream furnishes, besides, all the salts which the body requires.

CREAM SYRUP is made as follows:

Procure one gallon of fresh sweet cream, (which costs in Philadelphia 75 cents,) dissolve therein, without heat, fourteen pounds (avoir.) of pulverized sugar. If the dairy maid dipped too deeply in skimming, a little more sugar must be added. The whole will now measure about two gallons, and costs, per gallon, about 85 or 90 cents. It should be bottled immediately, labelled "Cream Syrup," and kept upon ice, or a cool cellar bottom, and will be good for from three to eight days, according to the freshness of the cream and the temperature in which it is kept.

By itself, it never pleases, but mixed in equal parts with strawberry, pineapple, vanilla, orange, or other syrups, it yields a corresponding and surpassingly agreeable syrup. The fruit syrups, however, must be something more than colored solutions of sugar; they must possess the odor and taste of the fruits they purport to represent, or we shall vainly endeavor to improve them with cream.

If orange cream be desired, the orange syrup must be made as follows: Pare, thinly, the rinds from *twelve* fresh sweet oranges, reject the pulp, and grind the peel to a smooth paste, with a pound or two of sugar, and an ounce of citric acid; add, thereto,

by degrees, two gallons of water and sufficient sugar to form a syrup, without heat, [about 30 lbs.,] strain and bottle at once. It must be kept on a cool cellar bottom until wanted.

Lemon syrup, when used to flavor cream, must be prepared from the fresh peel in a similar manner.

NECTAR CREAM is elegantly made by mixing six parts of cream syrup with three parts of vanilla syrup, and one part each of the syrups of sherry wine, pineapple and lemon. To this mixture, a little cochineal may be added, to please the eye.

A factitious cream syrup, that keeps well, may be made from 12 lbs. (avoid.) of fresh Jordan sweet almonds, four gallons of milk, and 60 lbs. (avoid.) of sugar, after the manner of orgeat. It answers extremely well when it is impracticable to use the veritable cream.

This is about all I can give you respecting cream syrups. If you desire anything further, I will be pleased to communicate all I know.

With much regard,

O. S. HUBBELL.

August 13th, 1855.

We believe the cream syrup made with good sweet almonds and fresh milk, is, in all respects, equal to real cream syrup; it keeps better, and is more uniform in consistence, inasmuch as cream varies with the care used in the skimming process, and with the season.

Cream nuts (Brazil nuts,) have also been employed instead of almonds.

As the sale of carbonic acid water, as a beverage, by pharmacists, appears to be increasing, and as its excellence depends largely on the temperature of the water and the flavor of the syrups, these two points should be constantly attended to. It is now generally conceded that a coil of from 50 to 150 feet of block tin tubing, according to the amount of draught, arranged around a lead lined box or tub with the ice in the centre, and a lateral tube to convey off the waste water after it rises to the top of the coil, is the best refrigerating arrangement. By surrounding the entire surface of the coil with ice-water at 32° F., the water may be cooled as fast as it is drawn through the tube, especially, if the ice extends to the bottom of the box or tub.

SYRUP OF HYDRIODIC ACID.

BY MR. JAMES MURDOCH.

Hydriodic acid in a liquid form has been introduced into medicine by Dr. Andrew Buchanan, as having the therapeutical powers of iodine without its irritant action. It has also been employed by him in the treatment of choleraic disease, and accordingly becomes a preparation of considerable interest.

The following speedy formula he has given for preparing it:—

Take of Tartaric acid, 264 grains,
Iodide of Potassium, 380 grains.

Dissolve each separately in f. ℥jss. of distilled water; mix the solutions, agitate and strain to separate the bitartrate of potash, adding water to make up the measure to f. ℥vj½. Each fluid drachm of this solution should contain 5.072 grains of hydriodic acid, equal to about 5 grains of iodine. When the solutions are mixed the liquid assumes a slight yellow color, and in ten minutes after gives a slight tinge of violet with a cold solution of starch, which gradually changes to a deep blue.

This rapid decomposition appears to arise in some measure from the agitation necessary to effect the separation of the bitartrate, and consequently greater contact with the air. When hydriodic acid is prepared by the sulphuretted hydrogen process, it does not show decomposition for an hour or two after it is prepared; but if moderately agitated it shows the presence of free iodine much more speedily. It is, therefore, essential in dispensing this acid, to prepare it extemporaneously and supply it frequently to obtain its medicinal action. It may very speedily be prepared by the above process; and for convenience the solutions may be kept ready made and mixed when required; but as 264 grains of tartaric acid in f. ℥jss. of distilled water measures f. ℥xv., and 380 grains of iodide of potassium in the same quantity of water, measures f. ℥xiv., it will be necessary to employ them in these relative proportions. Dr. Buchanan also directs it to be taken in starch gruel, which has the chemical effect of combining with the iodine that is liberated during the time of its administration.

I find that hydriodic acid may be prevented from undergoing this decomposition when in the form of a syrup.

The antiseptic properties of sugar are well known to the

Pharmaceutist, in the vegetable kingdom in the case of vegetable syrups, and in the mineral kingdom in the case of certain proto-salts of iron, where the presence of sugar prevents the latter from becoming peroxidized by the absorption of oxygen, as in the cases of the carbonate, iodide and protonitrate of iron.*

What method, therefore, will be best adapted for the preparation of this syrup? In the usual way of preparing hydriodic acid, by passing sulphuretted hydrogen through iodine suspended in water, the iodine is very apt to be enveloped in portions of the sulphur that is set free, and escape the action of the H S. This being guarded against, a solution of hydriodic acid could be obtained, from which a syrup might be prepared, if cautiously operated upon, that would contain no free iodine. The repugnance, however, that is usually felt by the Pharmaceutist to the employment of H S, as the means of preparing pharmaceutical products, would render this process objectionable, although it should be found to be in other respects available.

With another means of preparing this acid, by decomposing a solution of iodide of barium by the equivalent of sulphuric acid, and filtering to separate the insoluble sulphate of barytes, as the iodide of barium itself is an unstable compound, it would be necessary to prepare this salt at each manipulation.

Assuming, therefore, that if a syrup can be prepared by Dr. Buchanan's solution that shall contain no free iodine, it will furnish the most suitable manner of obtaining this acid for medicinal purposes, I have to propose the following proportions for a syrup. It is necessary, however, to observe, as one of the conditions of success, that the iodide must be free from any trace of iodate of potash.

Of four different samples of iodide that came under my notice, all gave a slight iodine reaction with solution of tartaric acid and starch. These, although containing extremely little of the other impurities usually found in iodide of potassium, were contaminated with a minute portion of iodate of potash. They had been prepared by what is known as the caustic potash process, and accordingly extremely liable to contain some undecomposed iodate.

*Syrup of protonitrate of iron, *Pharmaceutical Journal*, vol. xi., pages 329 and 330. W. Procter, Jun., and W. Livermore.

But as it is quite possible to produce a salt by this process that shall be entirely free from even a trace of iodate, I think it is only necessary to guard manufacturers against this salt occurring in their product, to make it suitable for preparing hydriodic acid. I have accordingly used an iodide prepared by the Pharmacopœia method of decomposing the solution of iodide of iron by carbonate of potash:—

THE SYRUP.

Take of Sugar	.	.	3ij. 3ss.
Water	.	.	3v.

Dissolve in a flask with the aid of heat, and allow it to cool. Prepare solution of hydriodic acid as before mentioned, without adding any of the additional water. This operation should be done speedily, and it may answer for that end to strain it through calico. If paper were used, decomposition would show itself before filtration could be completed, unless the quantity was small. Of this strong solution take f.3ss and ℥j. and mix with the syrup. The whole should measure f.3ijss., and each f.3j contain the equivalent of gr.ij. of iodine.

Or it may be prepared by dissolving the hydriodate and tartaric acid, each in syrup instead of water, mixing them together and letting it stand for a few hours to allow the bitartrate to settle, and pouring off sufficient for the required quantity of syrup. With this latter mode, which appears the more feasible of the two, a slight decomposition takes place with the syrup in the first instance, probably owing to the quantity of sugar being insufficient to preserve it; but after being mixed with the larger portion of syrup it remains unchanged.

Syrup of hydriodic acid, by the first method, I have had prepared since the 3d of June, and it remains nearly colorless. I have also syrups having some color, which have been made for several months, that have the same appearance as when first prepared. In a syrup prepared early in the winter the sugar has crystallized out of the solution, and the liquor on the surface, now weak of sugar, has a bright yellow color, and gives a strong reaction with starch; but the crystallized portion is not affected by it unless a little nitric acid is also added, when it reacts strongly.

Hydriodic acid being gaseous it will not be possible to procure it in a solid form combined with sugar. When a strong solution

is mixed with powdered sugar and moderately heated, it gives off bubbles of hydriodic acid, becoming darker in color, reacting strongly with starch, and ultimately becoming completely black, with abundance of free iodine.

The precise action of sugar with reference to those compounds that have been named, is still obscure. Klauer considers that a regular compound is formed in the case of carbonate of iron, but the subject of this notice is an instance where the action of sugar is not confined to salts of iron.

In conclusion, it is very probable that the protective agency of sugar, is exercised over many other decomposable substances that have not been examined as to this property; and if it be so, it must become of corresponding importance as a chemical agent in Pharmacy.—*London Phar. Jour. August 1st, 1855.*

Glasgow, July 9th, 1855.

NITRATE OF SILVER AND TANNIC ACID IN PILLS.

By W. COPNEY.

Having been applied to as to the propriety of exhibiting these substances together in the form of pills, some experiments were made to determine the chemical change which might occur.

It was believed, *à priori*, that a change would occur, from the well known tendency of tannic acid to run into gallic acid when exposed to the air in a humid state, or when brought into contact with oxygen acids or their compounds. It was thought, however, that in the form of a pill, made as firm as possible, any change which might occur would not proceed very rapidly. Some pills having been prepared, each composed of half a grain of nitrate of silver and three grains of tannic acid, with a suitable excipient, it was observed that they quickly became swollen and subsequently cracked.

An indication was thus given that a change had taken place, which was supposed to have arisen from the absorption, by the tannic acid, of oxygen at the expense of the nitrate, reducing it to oxide, with the formation of gallic acid; the softening, enlargement, and cracking of the pills being referred to the formation of water and the escape of carbonic acid gas, which are always produced when tannic acid is converted into gallic acid.

Solutions of these substances were then separately prepared

and mixed. The liquor became brown, and a precipitate was speedily formed. On leaving the mixture during the night, the surface was found covered with a thin pellicle of reduced silver, and deposited was found some oxide of silver. It thus became clear that the tannic acid had not only the power, as was expected, of reducing the nitrate of silver to oxide, but had further reduced a portion of the oxide itself to the metallic state.

One of the pills before mentioned, having become quite hard, was triturated with distilled water, and the liquid filtered. To the filtrate was added a chloride—not the least trace of chloride of silver was observed; to another portion of the filtrate was added sulphuretted hydrogen, without the least change of color.

It may, we think, therefore, be fairly deduced that such a compound is decidedly incompatible, at least as far as the chemistry of the compound is concerned. The therapeutical view of the matter must be left to the judgment of the medical practitioner, there being many compounds which, although composed of incompatible elements, are not, necessarily, therapeutically incompatible.—*Ibid.*

ON THE MANUFACTURE OF ALUMINIUM.

By M. H. ST. CLAIRE DEVILLE.

The following is the substance of a paper presented to the French Academy at the session, June 18th, 1855, and published in No. 25 of the *Comptes Rendus*.

The author stated that he had the honor of presenting to the Academy the first specimens of aluminium that he had prepared at the Javel Chemical Works, under the patronage of the Emperor, at his expense, by a process which he describes. He considers that manufacturing processes have been attained for the production of chloride of aluminium and sodium, the materials used in the fabrication of aluminium.

He obtains the chloride of aluminium by acting on a mixture of alumina and coal tar, previously calcined, with chlorine, which is readily effected in a common gas retort, the layer of the mixture being from four to eight inches thick, which is readily penetrated by the gas. The chloride is condensed in a chamber of glazed brick work. Obtained in this way it is a crystallized compact substance of a sulphur yellow color, of considerable density and but slightly ferruginous. This contamination is removed by passing

the vaporized chloride over points of iron heated to 750° Fahr., whereby the sesquichloride of iron is fixed as protochloride, whilst the aluminous chloride passes out and condenses in colorless and transparent crystals.

Sodium may now be prepared with facility in large or small vessels. M. Deville has carefully studied with great care the influence of temperature, of the heating surfaces, and the quickness with which the sodium vapor issues from the apparatus, and he is convinced that a proper regulation of the heat, and the diameter of the tubes for the exit of the sodium, will enable him to produce this metal at a heat as low as that of melting silver. In the experiments already made the heat used was less than that necessary in manufacturing zinc. The author is now seeking a continuous process for making sodium, as he finds it unnecessary to redistil the metal, it being pure from the first operation.

In relation to the reaction of chloride of aluminium with the sodium, it is effected in metallic tubes, which in shape and in process of management have not yet been well adapted to a manufacturing scale, yet the author thinks that the difficulties which at present exist will soon be resolved.

M. Dumas presented to the Academy, on behalf of M. Deville, some large and beautiful masses of chloride of aluminium, of sodium, and of metallic aluminium in bars, obtained at the Javel works during the course of experiments there made at the expense of the Emperor, and accompanied them with the following remarks :

The process of making chloride of aluminium having afforded it to the extent of 200 to 300 kilogrammes, it may be considered as an operation susceptible of being extended on a manufacturing scale.

M. Deville's process for sodium yields that metal with great regularity and facility.

The materials employed in the manufacture of one kilogramme of aluminium—alumina from ammonia alum, chlorine, charcoal, carbonate of soda and chalk—are all cheap, being worth now about 32 francs, whilst the price of sodium before was 1000 francs per kilogramme, at which rate that quantity of aluminium would cost 3000 francs.

M. Deville's experiments not only demonstrated the possibility

of making aluminium on a large scale, but by producing sodium at a cheap rate have brought its valuable properties within the reach of scientific men as a re-agent.

In fact, with the energy of potassium, this metal presents none of the difficulties in its preparation peculiar to the former. M. Deville's experiments show that it may be made almost as easily as zinc, that it may be exposed to the air in a fused state without inflaming, and may flow in the fluid state from the apparatus used in making it.

M. Dumas alludes to the reduction of chlorides as a feature in metallurgy likely to be productive of new results. He considers Marseilles as the best location for the manufacture of aluminium, owing to the cheapness of materials obtainable there.

In concluding, M. Dumas called the attention of the Academy to the sonorousness of aluminium, which can only be compared to that of the most sonorous bronzes, such as bell-metal, which has not been noticed in any other pure (unalloyed) metal, thus adding another to the singular features of this curious metal.

Comptes Rendus, June 18, 1855.

AROMATIC SYRUP OF GALLS.

The following preparation has been considerably employed in Philadelphia, and is attributed by some to the late Dr. Joseph Parrish, of this city. It is used in the diarrhoea of children.

Take of Galls, powdered,	half an ounce.
Cinnamon, bruised,	
Nutmegs, bruised, of each	two drachms.
French brandy,	half a pint.
Sugar, in small lumps,	two ounces (troy).

Macerate the solid ingredients in the brandy for twenty-four hours, throw on a filter, and, when drained, add diluted alcohol till half a pint in all has passed.

Having placed the tincture in a shallow capsule, suspend the sugar over it, on a slip of woven iron wire, and then inflame the tincture. The flames proceeding from the burning alcohol fuse the sugar and scorch it so as to produce a portion of caromel, and as it melts it falls into and dissolves in the liquid beneath. When the combustion stops the whole should be stirred and filtered for use.—EDITOR AMER. JOUR. PHARMACY.

ON AN EASY METHOD TO PURIFY SULPHURIC ACID FROM ARSENIC.

By L. A. BUCHNER.

[From Buchner's Repertorium, 1855, p. 124. By J. M. Maisch.]

It is a well known fact that arsenious acid by aid of hydrochloric acid is transformed into chloride of arsenic. Liebig (Jahresbericht, 1851, p. 630) has found, that chloride of arsenic is separated in oily drops, and may be distilled off, when arsenious acid is dissolved in hydrochloric acid, or on the mixture of this with a liquid containing arsenious acid, afterwards adding concentrated sulphuric acid. Chloride of arsenic boils at 132°C ., (270°F .) and evaporates very easily with the vapors of hydrochloric acid, under its own boiling point, whilst concentrated sulphuric acid does not evaporate until it has reached its boiling point, at $325\text{--}327^{\circ}\text{C}$., ($617\text{--}620^{\circ}\text{F}$.)

I do not know that these facts have been employed for the removal of arsenic from sulphuric acid; but that this acid may be purified by a method founded on them, I have conclusively shown by experiments. A little muriatic acid added to a sulphuric acid containing arsenic, and heating, or, what is better and preferable, hydrochloric acid gas passed into such heated acid, separates all arsenic as chloride of arsenic. Intentionally I have dissolved a large quantity of arsenious acid in concentrated sulphuric acid, and treated this solution in the above manner. In a short time the arsenic, in connection with the hydrochloric acid, was so completely driven off that not the smallest possible trace could be detected in Marsh's apparatus, even after operating for half an hour. The heating of the acid need not be continued but a short time after stopping the steam of hydrochloric acid, and every trace of it, if necessary, will be driven off.

This I believe to be the only reliable mode of making sulphuric acid free of arsenic in a short time and at little expense, for chemico-legal investigations and medicinal pharmaceutical purposes. It is well known, that this cannot be achieved by rectification of an impure oil of vitriol, inasmuch as its point of sublimation is not far enough from the boiling point of sulphuric acid, and even lower than this, it being at 218°C ., (425°F . Mitchell) and to dilute the acid, precipitate by sulphuretted hydrogen, de-

cant and evaporate again, is too long and disagreeable a task to be preferred to the purification with muriatic acid ; this last method, perhaps, has another advantage, to evaporate the nitrous acid present in most commercial sulphuric acid as chloride of oxide of nitrogen.

ON SULPHATE OF ALUMINA AND ITS USE.

By PROF. DR. WATTL.

[Translated from Buchner's N. Repertorium, 1855, p. 1. By J. M. Maisch.]

Sulphate of alumina is one of the most useful salts of all those that have recently come into technical use. It is often prepared in large quantities in chemical factories, for the use of paper and Prussian blue manufactories ; its price is low, it is unchangeable in the air, and contains 25 per cent. of alumina, which makes it much cheaper than alum, that contains but one half of it. Chemically spoken, it may be viewed as alum without potassa or oxide of ammonia, which are replaced by alumina.

Although it has long since been known that sulphate of alumina separates both the above bases from even mineral acids, for which reason chloride of potassium is used in manufacturing alum, still nobody has thought of it yet, to separate in this way tartaric acid and potassa of cream of tartar, thus to find a new way for making tartaric acid.

1½ oz. sulphate of alumina dissolved in 1 lb. water with the addition of about ½ oz. sulphuric acid, necessary to form the double sulphate (alum), decompose 1 oz. of cream of tartar, by digestion without boiling ; after a slow evaporation this will yield on cooling 2 oz. alum in large crystals, free of iron, and all the tartaric acid which may be obtained in crystals by a very slow evaporation. I recommend this new mode of obtaining tartaric acid to all manufacturers ; it is much cheaper than the old way, which requires so much room, heat and time.

By means of the sulphate of alumina, the amount of potassa in table salt, Glauber's salts, cubic nitre, and in the mother liquors of sea water and saline brines, may be detected, and the allegation is not so improbable as at first it may seem to be, that in a future time we may obtain from the waters of the sea, an article for the production of which we have at present to look to the

forests—I mean potash. The well known “Orber Badesalz,” (from the saline spring Orb, in Germany,) contains so large an amount of potassa that procuring it from such a source is not an impossibility.

Another of the properties of sulphate of alumina must be mentioned here—the readiness with which it parts with its acid. In a good glass retort a dull red heat liberates from the anhydrous salt, the sulphuric acid which distills over and leaves pure alumina in a light state behind, which may be used for preparing other salts of this base. This method to obtain a chemically pure sulphuric acid merits recommendation, as the commercial articles of this acid are scarcely ever pure, rendering them unfit for analytical investigations, as also for medicinal use.

OBSERVATIONS ON THE ROOT OF GOSSYPIUM HERBACEUM, OR, COTTON PLANT.

By THOMAS J. SHAW, M. D., of Robertson County, Tenn.

Cotton Root—Its General Characters.—It is fusiform in shape, giving off small radicles throughout its length. The size of the root varies, according to the soil from which it is produced. Its length varies from a few inches to that of a foot. When the root is cut or broken, it displays a white color; the bark is of a reddish brown; the taste is pleasant, somewhat sweet and astringent; it contains more of the latter principle than the root from which it is procured; it is very mucilaginous in its properties. The root is easily broken when dry, but the bark is quite tenacious, pulling off in strings.

This root is too well known in this country to require a lengthy description; therefore I will pass to the chemical analysis, as prepared and furnished to me by my esteemed friend, Mr. H. B. Orr, of Nashville, Tenn.

Chemical Examinations of the Root.—The result of which, as accurately as might be determined, is as follows, to wit:

Gum, Albumen, Sugar, Starch, Tannic Acid, Gallic Acid, Chlorophyle, Iodine, Caoutchouc, Black Resin, Red Extractive Matter, Black and White Oleaginous-like Matter. The latter two abound in this plant.

Proximate Principle.—Experiments were made with a view to the isolation of the active principle of the root, which were not altogether satisfactory; for though there was no crystalline principle obtained, as was desired, making the existence of it palpable and distinct to all; still there is evidence in favor of a principle existing in it. Time did not admit of an extended experiment in this department of the analysis. The author indulges a hope of having time to examine the active principle more minutely than he has yet done. What he has seen suffices to convince him that the medical properties attributed to it are not fallacious.

The attention of the medical profession was called to the medical properties of this root, first by Drs. McGown and Bonchell, of Mississippi; the latter gentleman by an article written in the *Western Journal of Medicine and Surgery*, about the year 1842, as well as I recollect. For a want of confirmation, it passed unnoticed by the profession, until the year 1852, when it was again brought into notice in an article written by Dr. John Travis, of Marlborough, Tennessee, in the *Nashville Journal of Medicine and Surgery*. He reported but one case in which he tried it, and it was with entire success, restoring the menstrual flow in a short time, after an absence of about ten months.

I consider this root one of the very best emmenagogues of the *materia medica*, and I think it should be so classed. My reasons for considering it such, are grounded upon the different experiments which I have made with it, within the last twelve months. I sometimes use a decoction, and at others an infusion, but most generally a decoction, prepared thus:

R. Cotton Root,	℥iv.
Water,	lbs. ij.

boil down to one pint. S.—A wine glass full every hour. This produces the most salutary effect in dysmenorrhœa; it acts as an anodyne in allaying the pain, and as an emmenagogue in aiding or augmenting menstruation; its action is very speedy; after its exhibition, in this case it produces an effect which, indeed, appears almost natural, that is, almost without pain; the patient, after its exhibition, feels but little inconvenience from pain, which soon subsides, and menstruation is immediately aug-

mented, without acceleration of the pulse or gastric uneasiness. There are few other emmenagogues that can claim this feature.

Its action in amenorrhœa I think superior to any other emmenagogue belonging to the materia medica, though it would be proper to pay some attention to the general health of the patient before its exhibition. It is superior to any thing that I have tried in the way of emmenagogues. I have had cases in which I first tried the usual emmenagogues, with but little effect, (or success,) when I would determine on trying the decoction of this root, which would far surpass my expectations by acting with the most marked effect; menstruation being produced on the following day after its exhibition. All of the symptoms disappeared on exhibition of this medicine. I believe this to be the best emmenagogue that we can employ in mere suppressio mensium, where there is no other disturbance in the general health.

With the usual emmenagogues, I was enabled to produce the catamenia on a young lady, which continued for about twenty-four hours, then suddenly becoming very sparce and painful; and in a few days after this period had passed, I employed the infusion of the cotton root as a means of exciting this function, which it did on the following day, a plentiful discharge being produced, which continued for five or six days. She has been regular at every period since that time, and has enjoyed good health, with the exception of a few simple attacks, which caused no derangement of the menstrual function. For about twelve months previous to the exhibition of this medicine, her health was very much impaired, but she commenced improving, and soon recovered her health. I could detail other cases similar, in which I have tried the decoction with the same effect, but I deem it unnecessary to mention its action in each individual case.

As a parturient agent, I think it superior to ergot in one sense of the word, and in another about its equal, its action being about as prompt as that of ergot, and attended with much less danger. I have tried both in parturition, and found the cotton root decoction to act with fully as much efficacy as ergot. In some cases in which I have tried it, the pain was to some extent allayed, and labor promoted with as much speed as when ergot was administered. It appears to be perfectly harmless, from the fact that its action is almost unattended with pain. It causes

neither gastric distress, or acceleration of the pulse; if it does, it is not perceptible; both of which are occasioned by ergot, to some extent.

I have witnessed its action in retained placenta with good effect, which was an expulsion of the mass in about twenty minutes after the exhibition of the first dose. It may be proper to say, that I gave two doses before the placenta was thrown off. I believe it to be safer as a parturient agent, or an emmenagogue, or at least as safe, as any other article of the materia medica.

It should have a fair and impartial trial by the profession generally, because it will prove itself worthy of the time and labor spent in its investigation. It is handy to all, and free of expense. A few trials by the profession will confirm the truth of this short essay. Give it a trial, and it will prove itself in some case of amenorrhœa, dysmenorrhœa, or probably in some lingering case of labor, which may require the assistance of medicine, to produce contraction of the uterus for the expulsion of the child. I think it worthy of the attention of the profession, in the above cases.

Tincture of the Cotton Root as a Tonic.—There is a condition of the system in which this tincture acts as a valuable restorative. These cases are of a leuco-phlegmatic temperament of both sexes, but it is to the female sex that I wish to draw the attention of the reader. Where there is general bad health, accompanied with tardy menstruation, I have used it with the happiest effect; in a few cases of emansio mensium, caused by anemia, where the patient was troubled with pains in the loins and giddiness of the head, with a derangement of the digestive organs, such as anorexia, accompanied with an uneasy, depressed feeling at the scrobiculus cordis, every month, which was promptly relieved by the tincture, but not with the effect of producing the menstrual flux, which was afterwards produced by the decoction, I find it necessary to continue the tincture from two to four weeks. The strength of the tincture that I have been in the habit of using, is prepared thus:

Bark of the Root, (dry,)	3vij.
Diluted Alcohol,	lb. ij.

Digest fourteen days, then filter and give it in 3j. doses, three

or four times a day. The tincture which I used was prepared by myself; and as I have seen no account of its use, I claim the first preparation of it, as well as the first experiment with it. My brother, Dr. H. J. Shaw, has since tried it, with the same good effect; in fact, his experience coincides with mine throughout. In closing this short and imperfect essay, I indulge a hope that it will prove of some service to the profession.—*Nashville Journal of Medicine and Surgery, July, 1855.*

ON TRAGACANTH AND ITS ADULTERATION.

BY SIDNEY H. MALTASS, Esq.

(From a Communication addressed to Mr. Daniel Hanbury.)

According to your request I have obtained from various sources some information respecting gum Tragacanth; that regarding the mode of collecting is from eye-witnesses—that upon preparing it for the European market, from personal experience.

The small prickly shrub which produces tragacanth, grows wild in many parts of Asia Minor, particularly in Anatolia. It is termed by the Greeks *Ketré*, but is also known to the educated Greeks by its real name, *τραγακάνθος*; the gum is in Anatolia likewise called *Ketré*, but to the Greeks it is also known as *τραγακάνθος κομμι*.

The principal places in which tragacanth is collected, are Caissar or Kaisarieh (the ancient Cæsarea,) Yalavatz, Isbarta, Bourdur and Angora. The gum from Yalavatz and Caissar is considered the best.

Formerly the proportion of *flaky or leaf gum* in the whole quantity collected was very small, as the peasants contented themselves with picking off from the shrubs the natural exudation; of later years, a more systematic process for obtaining the flaky gum has been adopted at Yalavatz, and has since been followed by the Caissar and other districts. Gum tragacanth is now collected in the following manner:—

In July and August the peasants clear away the earth from the lower part of the stem of the shrub, and make several longitudinal incisions with a knife in the bark; the gum exudes the whole length of the incision, and dries in flakes; three or four days are sufficient for this purpose, and the gum is then collected.

In some places also the peasants occasionally puncture the bark with the point of the knife. If the weather be hot and dry, the gum is white and clean ; but if the atmosphere be damp and the heat but moderate, the gum requires a longer time to dry, and assumes a yellow or brown tinge. High winds are favorable for drying, but the gum accumulates a certain proportion of earth. Whilst the peasants are engaged in this labor, they pick off from the shrubs the gum which exudes naturally, and it is this which chiefly constitutes the quality known in England as *Common* or *Sorts*.

The whole of the tragacanth gathered is mixed and sold to native merchants, who send it to Smyrna for re-sale in bags containing about two hundred weight each. In this state it is termed *rough gum*, and contains as follows :

Flaky or leaf gum, perfectly white	40 to 50 per cent.
Ditto ditto discolored or brown	15 25
Vermicelli gum	10 15
Common or sorts	35 10

The finest parcels contain the most *vermicelli*, which is nothing more than the siftings of the *leaf* gum which is broken by carriage from the interior and by removing from one place to another, together with the small vermicular masses termed *Sesame seed*, which are collected with the *leaf* gum.

When gum tragacanth is purchased for shipment to Europe, it is prepared in the following manner:—The large, white, flaky, or *leaf* gum, termed *French quality*, is first picked out, and the residue is sifted through a coarse sieve ; what remains upon the sieve is *common* or *sorts* gum, mixed with *discolored leaf*, which is returned to the pickers, who then remove the slightly discolored *leaf* gum, which is termed *English quality*. The remainder is then examined, and any stones or very black, dirty pieces, are thrown aside as refuse, the rest, composed of naturally-exuded gum and brown *leaf*, is termed *common* or *sorts*.

The head-man or master-picker then re-sifts with a finer sieve whatever gum passed through the first, occasionally throwing out any straw or light substance which rests at the top. The gum remaining upon the sieve after this second sifting is given to women to pick at their own houses. They separate the *white* from the *brown*, and the *brown* from the *common*. The first is mixed with the *French quality*, the second with the *English*.

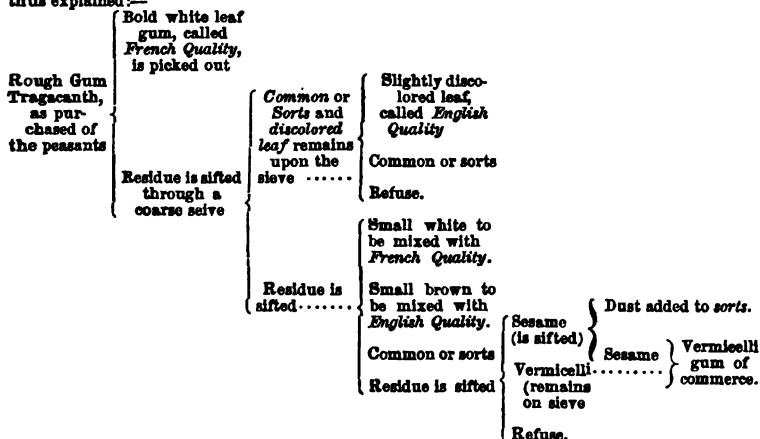
A third sifting takes place with a still finer sieve. The gum which passes through is termed *Sesame Seed*, and the coarser which remains upon the sieve, *Vermicelli*. Both qualities are carefully picked by women. When cleaned, the *Sesame Seed* is again sifted with an extremely fine sieve; and the dust and minute particles sifted out, are added to the *sorts* or *common gum*. The *Vermicelli* and *Sesame Seed* are then mixed together. This mixture forms the *Vermicelli Tragacanth* of commerce.*

When the gums are intended for the French market, the fine white *leaf* only is shipped; the *vermicelli* is sold for Trieste, and the discolored *leaf* and *sorts* for England.

If, however, the whole parcel be worked for England and be required *good*, then the French and English qualities are mixed, and the brown *leaf* which had been left in the *sorts* is also picked out and added. By so doing the value of the *common* or *sorts* is reduced.

I believe it is supposed that more than one plant produces the gum Tragacanth of commerce. For this there is some foundation. In fact, very little gum Tragacanth is shipped to England in the state above described. In order to explain this, I must begin by stating that besides the real gum tragacanth of Anatolia, there are two other kinds of gum collected in Armenia and Caramania from various trees, principally (as I am informed)

* The various siftings and pickings to which gum Tragacanth is subjected at Smyrna, may be thus explained:—



wild almond and plum. That from Armenia is sent to Constantinople from Moussul, whence it derives its name *Moussuli*. That from Caramania is sent direct to Smyrna, and is termed *Caraman*.

The average value of Moussul gum is 10 *piasters* per *oke* of lb. 2⁶⁷/₁₀₀, equal to about £3 16s. sterling per cwt.; Caramania gum is worth *p.* 4 or *p.* 5 per *oke*, or £1 10s. to £1 18s. per cwt.; whereas the usual value of gum tragacanth in its rough state is £10 per cwt.

Both these gums are, I believe, almost worthless, but are paid for at these high prices for the purpose of mixing with gum Tragacanth, and by some are considered to be an inferior kind of the same gum. As neither Caramania nor Moussul gum occur in flaky pieces like tragacanth, and as they are of a dark color, particularly the former, they would be easily detected if mixed with *leaf* gum, without previous preparation. The Jews, therefore, who adulterate all the drugs of Turkey, have found means of deceiving the eye in the following manner.

A quantity of Caramania gum is broken up into small irregular pieces, which are whitened with *White Lead*; the whitened gum is then mixed with *leaf* gum to the extent of 50 per cent. It is prepared in a similar manner for the *vermicelli*, but is pounded into smaller pieces and added only to the extent of 25 to 30 per cent. To adulterate the *sorts* or common gum, the Caramania gum is prepared in a similar manner, but the pieces are left larger: the proportion added is frequently 100 per cent.

Moussul gum is used for adulterating the better kinds of tragacanth.

The average expense of handpicking 1000 *okes* or 2667 lbs. of gum Tragacanth, is at the rate of 1½ *piasters* per *oke*, or eleven shillings per cwt. Thus:—

Labor of men, picking and sifting, 119 days, at piast. 10 per day	1190	0
Picking by women, 130½ <i>okes</i> broken leaf gum, at piast. ½ per <i>oke</i>	81	56
“ “ 64½ <i>okes</i> Vermicelli, at piast. 1 per <i>oke</i>	64	25
“ “ 20 <i>okes</i> Sesame Seed at piast. 1½ per <i>oke</i>	30	0
Superintendent, 11 days, at piast. 10	110	0
Present to head-picker	25	0
	1500	81

Note by Mr. Hanbury.—[The author having had the kindness to forward a series of samples illustrative of the foregoing notice, it may not be uninteresting here to enumerate them:—

Superior qualities.

1. White picked Yalavatz gum tragacanth.
2. ————— Caissar gum tragacanth.
3. French assorted *leaf*—sample of seven cases.
4. Broken *leaf* picked by women, mixed with fine *leaf*.
5. Broken *leaf* of Caissar gum, mixed with fine *leaf*.
6. Vermicelli as picked out before mixing with *Sesame*.
7. Vermicelli—sample of one case.
8. Very small *leaf*, termed *Sesame*, mixed with *Vermicelli*.

Inferior qualities.

9. Common *leaf* mixed with *English assortment*.
10. English assorted *leaf*—sample of four cases.
11. Common or sorts—sample of two cases.
12. Small refuse, thrown out—almost worthless.
13. Large refuse gum—almost worthless.

Gums used for the Adulteration of Tragacanth.

14. Moussul gum.
15. Caramania gum, first quality, worth £2 10s. per cwt., to be mixed when broken up and whitened, with fine *leaf* and *Vermicelli*.
16. Caramania gum, second quality, worth £1 10s. per cwt., to be mixed when broken up and whitened, with *sorts* gum.
17. Caramania gum, broken into fragments and white lead, for mixture with *English assorted leaf*, in the proportion of 50 per cent.
18. Caramania gum in smaller fragments, whitened with white lead, for mixture with *Vermicelli*, in the proportion of 50 per cent.
19. Caramania gum, whitened with white lead, for mixture with *sorts* and common gum, in the proportion of 100 per cent.

The substances designated *Moussul Gum* and *Caramania Gum* belong to the somewhat ill-defined group described by pharmacologists as *Bassora Gum*, *Kutera Gum*, and *False Tragacanth*.

In a small but interesting collection of gums and gum-resins formed in Persia by W. K. Loftus, Esq., and deposited partly in the British Museum, and partly in the Museum of the Royal Gardens at Kew, is a specimen of our *Moussul Gum*, stated to be the "common *Ketira* of the Arabs, exuded from the *Gawan* or *Gabban* of Persia." Is this plant the *Cochlospermum Gossypium*, De C.?

The *Caramania Gum* appears identical with the *Gomme pseudo-adragante* of M. Guibourt, regarded by that author as the produce of *Astragalus gummifer*, Labill.

Further researches, however, are much required to determine botanically the origin of these substances.

The practice of whitening gum with carbonate of lead is deserving of attention. Mr. Maltass was informed upon his first inquiries on the subject, that the whitening was effected by starch; this, however, proved untrue, and it was afterwards reluctantly admitted that white lead was employed. I can fully confirm the existence of carbonate of lead in the samples No. 17, 18, and 19; and can also state that I have readily detected lead in the adulterated *Small Tragacanth* imported into the London market.

The gum used in adulterating tragacanth can readily be recognized upon careful inspection.—D. H.]

Pharm. Jour. July 1855.

A MODE OF TESTING THE PRESENCE OF PHOSPHORIC ACID IN A SOIL.

By DAVID STEWART, M.D. Chemist of the Maryland State Ag. Society.

Upon three watch glasses, each containing one-tenth of a solution of 1000 grains of soil—place severally $\frac{1}{4}$, $\frac{1}{2}$, and one grain of molbydate of ammonia, and evaporate each to dryness on a water bath. Now add to the contents of each dish, an equal measure, say $\frac{1}{8}$ oz. of nitric acid, and if no *yellow* precipitate remains undissolved, then no phosphoric acid exists in this sample of soil. If, however, a *yellow* precipitate does remain, and the half grain dish contains more than the quarter, and as much as the grain dish, then the proportion of phosphoric acid may be calculated, as its relation to $\frac{1}{4}$ gr. is too great, and its relation to one grain is too small; it being necessary to have 30 parts of molbydic acid for every one part of phosphoric acid present in order to the production of the full amount of yellow precipitate, *because this yellow precipitate is soluble in any excess of phosphoric acid.*

The solution of the soil may be made by throwing upon a glass funnel 1000 grains (or 2 oz.) of soil, and filtering through it nitric acid, until 1000 grains (or 2. oz.) are collected. Rain water may

be substituted for the pure nitric acid in larger proportions, and the solution may be obtained as I have directed in my formula published by Mr. Sands, in the Agricultural report for 1853, p. 153-5, (and which I then copied from my formula deposited in the Smithsonian Institute in 1850.) I have tried the modes of using this reagent suggested by others, and utterly failed to approximate to the truth. Moreover this is by half the most expeditious mode that I have met with, and the only one practicable in the hands of a novice. It is one that I devised several years since, and have used repeatedly in teaching my students. 20 lbs. of phosphoric acid may thus be easily detected in an acre of soil in a few hours.

Baltimore, May, 1855.

American Farmer.

BLACK STAIN FOR WOOD.

By C. KARMRASCH.

The author having learnt from Professor Altmüller, of Vienna, that Runge's black stain, which has been much recommended for some years as an ink for steel pens, furnished an excellent means of staining wood black, was induced to make some experiments, the result of which lead him to recommend it further for this purpose.

The ink in question, which may be readily prepared by any one, is applied to the wood without warming, or any other preparation, by means of a brush or sponge. When dry, the application of the dye is repeated, and three, or at the utmost four applications, produce a deep black color, which acquires the highest beauty when polished or varnished.

The stain may be kept for a long time ; and in simplicity of employment, as well as in the goodness and rapidity of its results, it exceeds the common black wood-stain, which it certainly equals in cheapness. The author has obtained equally good results with the most different woods, such as beech, cherry, poplar, lime, fir, &c.

The best method for the preparation of the chrome-ink, according to several comparative experiments, is the following :—4 lbs. or 2 quarts of boiling water are poured over 1 oz. of pounded commercial extract of logwood, and when the solution is effected, 1 drachm of yellow chromate of potash is added, and the whole well stirred.

The fluid is then ready for use as a writing ink or wood-stain. It has a beautiful violet-blue color, as may be seen from the thin stratum which runs down the glass when the bottle is shaken, but when rubbed upon wood it produces pure black. It may be prepared, even on a small scale, at the price of threepence per quart.

When the extract of logwood cannot be obtained, the preparation is rather more tedious. In this case 4 lbs. of logwood may be extracted by boiling with water for about an hour, and the fluid, separated by decantation and pressing the woody residue, evaporated to about 3 quarts; 1 drachm of chromate potash is then dissolved in it. The author has obtained remarkably good results in staining wood with a fluid prepared in this manner; but when it stands for a time, it deposits a considerable quantity of black sediment, which shows that it might have more water. Indeed Runge recommends a larger quantity both of water and chromate of potash for the preparation of his chromic ink. According to his receipt, 1000 parts of decoction to be prepared from 125 parts of logwood, and to this 1 part of chromate of potash is to be added. Perhaps a proportion lying midway between this and the preceding recipe might be the most advisable for a wood-stain, namely, 4 lbs. of logwood to yield 9 quarts of decoction, to which half an ounce of chromate of potash may be added.

The commercial extract is however to be preferred, as with it the preparation is made very quickly and with little trouble.—*Chem. Gaz. July 2, 1855, from Mittheil des Gewerbevereins für Hannover, 1854, p. 298.*

ALTERATION OF SUGAR DISSOLVED IN WATER.

E. Maumene* has found that cane sugar experiences the same change into uncrystallizable sugar, when kept for a long time in solution, as when heated with acids. A crystal of pure sugar dissolves in boiling potash without any coloration; but a solution of the same sugar after being kept for any considerable time becomes brown when boiled with potash, thus showing that the sugar has undergone change. The progress of this

* *Comptes Rendus*, xxxix., 914.

change is best observed by means of the saccharometer. The dextrogyration decreased most rapidly with a solution of pure sugar, and was less when the solution contained some lime, which appears to retard the change. The rapidity of the change is increased by heat. Glucose or gum do not, under the same circumstances, suffer any alteration. The presence of organic acids was found to exert but little influence upon the alteration of sugar.

From these observations the author concludes—1. That the roots of beet will yield less crystallizable sugar the longer they are kept; 2. That a diminution of crystallizable sugar must result from the method of drying the roots; 3. That the percentage of sugar in old syrups cannot be ascertained by means of the optical test; 4. The brown color, produced by heating syrup with potash cannot alone be taken as an indication of the presence of glucose, since the uncrystallized cane sugar presents the same reaction.

When the cane sugar in syrup which is old, or which contains gum, is to be estimated, this must be done by evaporation over lime or sulphuric acid. The cane sugar then crystallizes out, and the point at which the gum begins to dry may be very well observed. When the syrup contains glucose instead of cane sugar, no crystals, or very few, are obtained.—*Pharm. Jour.* July, 1855.*

CHARCOAL AS A MEDIUM OF INHALATION.

By MR. STEPHEN DARBY.

The explanation of the real action of charcoal, in contact with effluvia, for which we are indebted to Dr. Stenhouse, and the application of it in many ways for sanitary purposes, as recommended by him, has naturally given rise to many suggestions for the use of this most important agent.

[We observed this spontaneous change of cane into grape sugar, in a vial of simple syrup kept in our cabinet during six years, when using it in illustrating the reaction of potash on the two sugars. The coloration of the liquid in the cane sugar experiment led us to infer and believe this change had occurred.—*Ed. AM. JOURN. PHARM.*]

Among those which have fallen under my notice are one or two that have led me to make a few experiments; and although these are trifling, the results may perhaps be considered worth communicating.

My attention having been called to the advantages offered by charcoal for exhibiting remedial agents, as iodine, &c., in very minute proportions, by inhalation, I was somewhat in doubt whether the affinity of charcoal for iodine—which, according to M. Bechi and M. Magnes, is so strong as not to be overcome by a simple solvent—might not render useless the method proposed, as this would require the iodine to be diffused through the pores of the charcoal in a very finely divided state. The former gentleman, in his practically useful paper on the employment of charcoal as an economical agent for separating iodine from its natural and artificial combinations, detailed in the *Journal de Pharmacie* for July, 1851, states “that neither hot nor cold water removes from charcoal the slightest trace of iodine.” It is the same with alcohol, which one would have regarded as its true solvent; but quite the contrary occurs if we treat iodized charcoal with a substance for which the iodine has a strong affinity, and with which it forms an intimate combination—as with solution of potash, &c.

M. Magnes, a translation of whose paper appears in the *Pharmaceutical Journal* for April, 1852, states—“I intimately mixed together one part of iodine with nine parts of charcoal, only retaining its hygrometric water. The product had neither the odor nor flavor of iodine, and having washed it on a filter, I ascertained that the water that passed through was inodorous and colorless, and that it did not give a blue color to starch paste.”

I first employed ordinary wood charcoal, in the proportion used by M. Magnes (nine parts to one of iodine), and found, as he states, that from the salts of the alkalies and alkaline earths contained in the charcoal it was all converted into iodides of potassium and calcium, with traces of iodates of potash and lime.

I then used charcoal that had been exhausted with hydrochloric acid, thoroughly washed and dried, and treated it with iodine in the same proportion (one part to nine), when I found on triturating the mixture with a small quantity of water, and throwing

it on a filter, that no free iodine was contained in the water, neither could I detect any trace of iodic acid, or any combination of iodine; but on the addition of alcohol to the well-drained charcoal, a densely colored solution of iodine (proved by the usual tests) passed through the filter. M. Bechi is therefore in error in stating that alcohol does not remove it. Although the combination with, or rather retention by charcoal is powerful enough to prevent the abstraction of iodine by water, still it would not appear sufficiently so to cause any objection to its employment for the purpose proposed, should this be thought desirable, more especially as M. Magnes has shown that in drying at a moderate heat in presence of watery vapor, the iodine is in great part given off.

It is of course necessary, for the reason before stated, to use charcoal free from alkalies, alkaline earths, and their salts.

The employment of charcoal respirators has given rise to the objection—not, I think, well founded—that the charcoal would by use become deleterious, owing to its absorption of the carbonic acid given off from the lungs, and also from the formation of this gas by the oxidation in its pores of the volatile carbonaceous matter, or hydrocarbons, given off in small quantities from the same source. To determine if this be the case, I took a certain weight of coarsely-grained wood charcoal, placed it in a percolator, the receiver of which contained a solution of baryta and air that had previously been freed from carbonic acid, and passed a considerable quantity of cold boiled distilled water through the charcoal; only a slight turbidness was caused; this was allowed thoroughly to deposit, the supernatant liquor withdrawn by means of a siphon fixed in the apparatus, care being taken to admit only air free from carbonic acid. The precipitate was twice again washed, allowed to settle, and the water withdrawn, when the precipitate, thrown on a filter, dried and ignited, gave, (deducting the filter ash), 0.55 grains of residue. A similar weight of charcoal in respirators was worn for six hours by three healthy individuals, and treated in exactly the same way as the above; the residue obtained was only 0.33 grains, or somewhat less than that from the charcoal which had not been respired through. In both cases the carbonate of baryta contained only a trace of sulphate. An equal proportion of charcoal, heated to low redness and cooled in

an atmosphere of carbonic acid, when treated in the same manner, caused a dense precipitate of carbonate of baryta; so that the charcoal does not prevent the abstraction by water of the carbonic acid, as is the case with iodine.

If there were any grounds for the objection raised, the second experiment should have shown at least an excess of carbonate of baryta over the first, for, according to Scharling, "a man weighing 170 lbs. gives off from the lungs, in the course of one hour, 33.5 grammes (more than five hundred grains) weight of this gas," consequently a considerable volume must have passed through the charcoal employed. That the reverse is the case is doubtless due simply to the somewhat larger amount of alkaline carbonates contained in the first portion of charcoal.—*Ibid.*

CULTURE OF COCHINEAL IN THE CANARY ISLANDS.

By DR. THEODOR E. MARTIUS.

This costly coloring material, which was formerly obtained solely from Mexico, has, during the last thirty years, become an object of artificial culture. This has given rise to the introduction into commerce of cochineal from Teneriffe, Algeria, and it is probable that it will soon be obtained from the East Indies.

The accounts of the collection and preparation of cochineal are at present very contradictory, and the circumstance that *black* and *silver* cochineal are met with, has especially given rise to very discrepant views.

During the last two years Teneriffe cochineal has come into considerable competition with Honduras cochineal, and it would appear from the following statements more correct to consider this kind of cochineal as the produce of the Canaries. In a very interesting work by Dr. Julius Freiherr von Minutoli,* it is shown that in the year 1853 the culture of cochineal was carried on in the following of the seven inhabited Canary Islands:—

1. TENERIFFE.—The author states that the *niguera chucaba* or *tunera* grows remarkably well on this island.

2. FUERTEVENTURA likewise appears to be situated very favorably for the culture of nopal.

* El Pasado y Provenir de las Islas Canarias. Berlin, 1854.

3. LANZAROTI.—Here the culture of the cactus is very extended. It grows with great luxuriance and rapidity, and the culture of cochineal is carried on with great success.

4. GOMERA.—Here the attempts to establish this industry have been less successful.

It is likewise stated that the Indian fig grows well upon GRAN CANARIA, but no mention is made of the culture of cochineal there.

In PALMA, the sixth island, the production of silk appears to be more extensively carried on ; and in HIEROO, the deficiency of springs may render the culture of the cochineal insect or of cactus impossible.

It is also stated that there are in the Canaries three concentric zones. The first, *costa*, extends about a league from the coast inland, becomes wider when the surface is even, narrower when it is hilly. The intermediate zone, *mediana*, extends as far as the foot of the mountains in the centre of the islands, and the *cumbres* comprises the mountainous districts.

These remarks are necessary, in order to render what follows intelligible ; and it may be added that it is D. Santiago de la Cruz who has, with much trouble, introduced the culture of cochineal into the Canaries.

There are several species of *nopal*, *la tunera silvestre* Indian fig, *cactus tuna*, short leaf with numerous thorns, serve only for coloring sugar, fruit, and wafers ; and *la tunera amarilla*, with large, yellow, sweet fruit, and round green leaves. The *tunera blanca* is best adapted for the culture of cochineal ; but it is inconvenient, on account of its numerous thorns. Lastly, there is a Mexican species with very soft thorns, which is likewise available for cochineal culture.

In planting the *nopal*, land must be selected which is exposed to the sun and sheltered from wind, so that the insects may not be blown off the leaves. The soil must not be close and clayey, but light and porous ; so that the roots may easily penetrate downwards, and the moisture be retained within it. The soil may be stony, and the plants may even be set upon the bare rock, if there are any fissures into which the roots can penetrate. When they are planted upon the plain, the soil must be ploughed up at least a foot and a half deep. The plants are set in the furrows at

six feet distance from each other, and with sufficient watering they soon spread out.

In the autumn, strong nopal stems, with large, thick and thorny leaves, are selected. They must be more than a year old; and when they are to be planted in good land, each one must have at least two or three leaves developed. In inferior land one leaf is considered sufficient. The plants are broken off by the hand, and are exposed to the air for eight or ten days, in order that they may cicatrize; and during this period they must be frequently turned over. If they were planted at once they would die. A hole is made in the furrow, the plant stuck in so that it is turned towards the light, and that the wind and rain may strike the leaves only on one side. The lower end of the plant is covered with earth, and, according to the richness of the soil, the plants are set at a foot and a half or six feet apart. When the land in which the plants are set can be irrigated, this may be done about twenty or twenty-five days after setting them. When the weather is dry the watering is repeated at the end of a month. However, the water must not come in contact with the plant, but be led along between the furrows. From 2800 to 3200 plants of nopal are set upon half an acre of land. In December the soil is removed from the plants to admit more freely the access of air, but care must be taken not to go so deep as to injure the roots. At the same time weeds should be removed and manure applied. For this purpose pigeon dung is preferred, and in the absence of it well rotted pig or cow dung. The nopal plants in dry soil only require manuring every third or fourth year. In the spring the soil round the plant is again carefully cleared of weeds, the cobwebs removed from the plants, and a close search is made for an insect which burrows in the leaves or stem. This insect has a form very similar to the cochineal, and is called *cochinella bastarda*. It is very detrimental to the plants, and if not removed would cause them to die. Constant attention to the plants is indispensable. They require to be watered only when there is no rain, and then not more than every fortieth or fiftieth day. Too much moisture makes the fleshy leaves dry, hard, and yellow. As soon as the new leaves shoot out, the fruit buds are formed, and in order that the plants may not be deprived of too much sap, these are carefully re-

moved. They are distinguished from the flattened shoot of the young leaves by their round form.

The cochineal insect should only be placed upon plants three or four years old. During the first year, potatoes or barley may be grown in the space between the furrows, but afterwards this must be discontinued, so as not to interfere with the roots of the nopal.

In autumn the yellow leaves are removed. Good nopal serves for twelve or fourteen years for the culture of cochineal. In the months of March, April, or May, according to the season, the young broods are placed upon the leaves. In warm weather, they are hatched on the seventy-fifth or ninetieth day; in cold weather, ninety-three or one hundred and thirteen days are requisite. Those who are experienced in the matter, believe they can predict the day that the young brood will be hatched. So soon as they begin to move, the mother insects are carefully collected and spread out about an inch apart on boards in boxes. The cochineal are covered with rags an inch wide, and four or five inches long. These rags must not be larger, because when the leaves are overloaded with insects, they remain small and weak. Moreover, the females are then less productive, the leaves are consumed more rapidly, and the expenses proportionately increased. The rags are removed from the cochineal daily, or even more frequently, and when they are sufficiently covered with the young insects, they are carried in a basket to the nopal, each rag laid upon a leaf, and fastened with the thorns. After a few days, when the insects have spread themselves over the leaf, the rags are removed. The opinion that it is better not to place the insects upon the plants for at least six days, appears to be simply founded on prejudice, and is not confirmed by experiment.

Instead of the rags, small bags of muslin are sometimes used; a number of mother-insects are placed in each bag, which is hung upon the nopal leaves until the young are hatched, and the insects have crawled up on the leaves. Many insects are lost in this way, and it has also the inconvenience that the whole brood comes upon one part of the leaf, and their development is retarded.

When the young are hatched, the mother-insects which ap-

pear to be wholly exhausted, are collected and killed. These yield the finest and most valuable cochineal; *mother cochineal*, when dried, is quite black. It is known in commerce under the name of *black cochineal*, *cochineal renigrada*, *grana nigra*, and the pound costs eighteen reals.

It must not be forgotten, that the more leafy the nopal is, the less the insects like it, and for this reason the plants are allowed, just before putting out the young insects, to fade slightly, and are then watered some time afterwards to revive them. The insects become full-grown in fifty or sixty days. The males are very small, dirty-white, and winged; they die immediately after the impregnation of the females. The form of the latter is that of an ellipse divided lengthways; they are from three to four lines in length. The insects remain upon the same spot of the leaves after once settling, and when once removed, they are unable to attach themselves again either there or elsewhere.

In from sixty-five to one hundred and fifteen days, the breeding time of the new generation comes on, and the insects are removed to make place for the succeeding young ones. This is done with a broad knife with rounded end, and a piece of metal attached covering two-thirds of the convex surface, and attached to the handle, which extends a foot and a half in a tongue shape, so that the insects, when removed, fall into the hollow. The insects are detached from the leaf by the tongue-shaped handle, and swept off by the knife into a tin box held in the left hand. It is about five or six inches deep, triangular, and furnished with a handle at one side.

As the value of the cochineal depends upon the size of the insects, the largest are gathered first, and in this way an opportunity is provided for the remaining ones to become larger. The breeding insects are collected from among the larger ones. Their collection requires great dexterity and quickness.

The insects collected are killed daily, and for this purpose they are spread out in layers about an inch deep, upon trays of tin or clay, which are placed in an oven heated to 131° F. Great care must be taken not to burn the insects, or allow them to adhere to the bottom of the tray. When they are all dead, they are put into boxes and exposed to the sun until perfectly dry, and care must be taken that they do not become mouldy.

A more simple way of killing the insects, is to fill clay boxes holding about twelve pounds, and close them tightly for twenty-four hours. Twice the time is requisite when the boxes are smaller or only half-filled. The only objection to this method is, that the drying is difficult and tedious, requiring artificial heat.

Three pounds and a quarter of living insects yield one pound of cochineal. Before being sold, it is sifted through a hair sieve in order to remove the small white pollen (?) which adheres to them. Nevertheless, the insects are whitish-grey when dry, so that they are known in commerce by the name of *silver cochineal*, *cochinella jaspada*. The pound costs sixteen reals.

The productiveness of these insects is very great. The mother-insects are kept in the boxes fourteen or twenty-one days, and the rags are removed full of young once or twice daily, so that the number of young that a female may produce during twenty-four days and without food, amounts to a million.

The Canary cochineal is the next best to the Honduras. Women are exclusively engaged in attending to the cochineal culture. When the season admits of breeding the insects early, the second brood is placed on the leaves immediately after the first. When the winter rains are late, a third crop may be collected, at least in the coast district, for there the insects do not die in December, as they do in the colder regions of the mediania.

The nopal must be kept free from rats and lizards as well as birds.* The produce of an acre of good land planted with nopal, amounts annually to 500 pounds of dry cochineal. In dry land, the crop varies between 50 and 500 pounds.

It would be very serviceable to preserve the insects through the winter in the mediania district, and thus remove the necessity of bringing mother-insects every year from the coast district. Such a protection might be easily effected, by covering the nopal fields with a cane roofing. The following table shows the increased produce and exportation of cochineal from the Canaries:—

* Fowls are very fond of the cochineal insects, and find out the plantations very readily. To prevent their depredations, the inhabitants, who are compelled to feed the fowls of the nobility, tie them by the leg during the day.

Years.	Pounds.	Years.	Pounds.
1831 . . .	7½	1843 . . .	75,964
1832 . . .	118	1844 . . .	88,294
1833 . . .	1,060	1845 . . .	168,109
1834 . . .	1,752	1846 . . .	232,550
1835 . . .	4,561	1847 . . .	296,292
1836 . . .	5,966	1848 . . .	375,585
1837 . . .	7,001	1849 . . .	449,757
1838 . . .	23,112	1850 . . .	782,670
1839 . . .	27,661	1851 . . .	368,109
1840 . . .	66,521	1852 . . .	806,254
1841 . . .	90,919	1853 {	In January . 120,499
1842 . . .	69,116		In February . 111,331

Thus, in the year 1853, the exportation would probably amount to 1,300,000 pounds, and the value of this, since the increased price consequent on the failure of crops in Honduras, would be £225,000.

Erlangen, April, 1855.

Pharm. Journal, June, 1855.

ON SILICIUM AND TITANIUM.

By H. SAINTE-CLAIRE DEVILLE.

Amongst the compounds of oxygen with simple bodies, there is a group of substances whose analogies are incontestable, and which may be characterized by a single feature in their history. These oxides, which are not acted upon by chlorine alone, become converted into chlorides when in contact with charcoal, under the influence of a current of chlorine at a moderate temperature. Amongst them I shall mention those which will be referred to in this note, namely, silica, titanous acid and boracic acid. The radicals of these generally-diffused substances have not yet been studied in all their details, and I now lay before the Academy the result of my researches upon this subject.

When sodium is treated with chloride or fluoride of silicium in a tray placed in a porcelain tube heated to redness, the last traces of the metal may be removed; and all that is then necessary is to wash the residue, in order to obtain silicium with all the characters attributed to it by Berzelius. But if the portions which do not adhere to the tray be selected, put into a crucible, surrounded and covered with pure fused chloride of sodium, and heated to a sufficiently high temperature for the volatilization of

the greater part of the alkaline chloride, two kinds of products are obtained, which vary according to the temperature and the nature of the flux.

In the first place the graphitoid silicium already described by me* as being obtained from the *fonte* of aluminium, may be produced; fused silicium is also obtained in the midst of a gangue which resists the action of heat; it is then frequently crystallized.

Crystallized silicium has much resemblance in color with specular iron ore when a little iridescent. Its form cannot be exactly measured, the faces of the crystals being always curved; but the form presents so close a resemblance to those of the diamond, that this comparison has been made immediately by all the mineralogists to whom I have shown it. In this state silicium cuts glass.

The analysis of the crystals which accompanied the specimen exhibited furnished the following results;—100 silicium gave 205 of silica; calculation requires 209. The small quantity of matter which was wanting also contained silica and iron, but in proportions which might be neglected. Thus silicium, like carbon, beside which it has been placed in the series of metalloids, is capable of assuming three distinct forms:—

1. The silicium of Berzelius, which represents ordinary carbon.
2. Graphitoid silicium, which corresponds with graphite, and is obtained under the same circumstances as artificial graphite.
3. Crystallized silicium, which is the analogue of the diamond.

Silicium consequently differs from the metals in every respect.

I also exhibit some fused silicium, which has been extracted from different gangues. I cannot, however, state exactly either the temperature, which was very high, employed in this new experiment, or the mode of preparation which is most proper for attaining a certain result. I must observe only that silicium takes up iron, wherever it exists, even in vessels in common porcelain, which it corrodes in a singular manner.† In preparing silicium,

*Chem. Gaz., No. 287, Oct. 2, 1854, p. 362.

†It reacts upon alumina, at least in the presence of bases, furnishing vitreous products, which appear to me to be new, and which I am at present engaged in analysing. The vessels which I prefer are crucibles of coke, calcined and immersed whilst still hot in boiling muriatic acid. After remaining for some time in the acid, and being repeatedly washed, these crucibles are very good.

it is necessary therefore to exhaust every precaution in the purification of the original materials, particularly the sodium; to analyse it, it is put with a few drops of nitric acid into a small crucible of Sevres porcelain, and a very small quantity of pure hydrofluoric acid is added (silicium, when strongly heated, resists the action of hydrofluoric acid and nitromuriatic acid;) it should dissolve entirely, and the liquid, when evaporated to dryness, should leave no trace of ferruginous matter.

Silicium alloys metals, especially copper, to which it communicates a hardness so great that the metal resists the action of the file. This is copper-steel.

Titanium, obtained by exactly similar processes and calcined in crucibles of alumina, is infusible at a temperature which causes the vaporization of platinum; it resembles very iridescent specular iron ore, and crystallizes in prisms with a square base.—*Chem. Gaz.*, June, 1855, from *Comptes Rendus*, April 30th, 1855, p. 1084.

CHEMICAL EXAMINATION OF THE BAKERS' BREAD OF PHILADELPHIA.

By CHARLES M. WETHERILL, PH. D., M.D.

Bread is the most important element of our food, not only for its nutritive properties, but because it is susceptible of adulterations, which, though they may be small in amount, are nevertheless so constantly taken into the system that they cannot fail in the end to prove detrimental to health. We find accordingly a very general prejudice against the wholesomeness of bakers' bread, and the fault is attributed to the use of alum, which is supposed to be the reason that such bread presents a finer appearance than that made at home. Although this is a vulgar error, since such fine appearance is the result of art, and the bread need not contain any different ingredients from that which is home-made, bakers have thrown themselves open to suspicion, for wherever the bread has been examined on a large scale, adulterations have been found present, and, in some places, are of universal use. Mr. Normandy, author of the *Commercial Hand Book of Chemical Analysis*, states in the same work that "bread really pure, that is, made altogether of genuine wheat

flour, is, without doubt, to be found no where in London ;" in all the samples of bread examined by him, with but one exception, alum was detected, and in that exception, like the others, a certain quantity of potato flour or pulp was found.

Liebig in his *Chemical Letters** states, that he saw in an alum factory in Scotland, small mountains of finely ground flour of alum for the use of the London bakers. In the same work he gives an explanation of the mode in which alum acts upon the bread, and why it is used by the bakers. When the millers moisten their grain in order to facilitate the grinding and do not subsequently dry the flour, or when the flour is exposed to the moisture of the atmosphere, the gluten acts upon the starch to form acetic and lactic acids, which render the gluten soluble in water, which it is not originally ; the dough from such flour does not rise well, and the resulting bread is heavy and of bad appearance. Several salts act chemically upon the altered gluten of such flour and render it insoluble again, so that the resulting bread becomes white, elastic, light, and as if made from the best of flour, and capable of retaining more water, yielding, consequently, more bread from a given quantity of flour. The salts which produce this effect and which are used more or less as adulterations, are alum, subcarbonate of magnesia, sulphate of copper, and sulphate of zinc. The use of blue vitriol by bakers in the north of France and in Belgium, has been abundantly proved, as may be seen by a reference to Ure's Dictionary. Carbonate of magnesia, if it be not in too great an excess, cannot be regarded as injurious. Liebig has recently made some experiments upon the use of lime water in the baking of bread, and found that five pounds of a saturated solution of lime water for every 19 lbs. of flour, gave a bread of fine appearance, and which he deems more wholesome than if made by any other process, as such treatment supplies to bread the deficiency of lime which places it below peas and lentils in nutritive power.† He proposes therefore to substitute the harmless lime water, which acts in a similar manner, for the injurious adulterations in frequent use.

* P. 541 of Third German Edition.

† Liebig calculated the amount of lime in such bread, and finds it equal to what is naturally present in the seeds of the Leguminosæ.

The above mentioned substances being used to make a fair looking bread from damaged flour, and to cause it to retain a greater weight of water, another class containing chalk, plaster, lime, clay, &c., is employed sometimes, but I think rarely here, and which acts in increasing the weight of the bread; these cannot be added to any great extent without injuring its appearance, and are readily detected by the quantity of ash yielded by incineration. Finally, potatoes, starch, &c., are added in some places to the flour, and do not act injuriously to the health, although they diminish from the nutritive power (for relative weight) of the bread, and may be regarded as adulterations when the loaf is sold at the same price as the same weight of pure wheat bread. Salæratæ with the acids or salts used to liberate the carbonic acid, are only injurious when in excess in the bread; they act economically in affording the carbonic acid which puffs up and renders porous the bread, and which would otherwise have to be supplied by the flour itself by the action of the yeast.

I am not aware whether an extended examination of the bread for adulterations has been made in any of our cities, and it seemed interesting as well as important to ascertain whether we are furnished with a pure article, or if in any other respect an advantage is taken by the bakers over the consumers of bread. It was expected that a careful examination of the bread of 24 bakers taken indiscriminately from all classes of bakeries, and from different parts of the city, would supply the desired knowledge, and I am happy to be able to say, that although adulterations are employed in a very few instances, our bread is generally pure. It is gratifying to learn this, and although manifest reasons prevent publishing the names of these delinquent bakers in this article, there is a law to reach them, and I am ready at any time to give their names to the proper authorities.

[Dr. Wetherill then describes his method of analysis, the details of which we have not space to give. In a peculiar muffle arrangement, heated by gas, the bread after being carbonized, was introduced on a platinum dish and completely incinerated. The ashes were then accurately tested. To give additional certainty to the results, portions of bread were adulterated with minute quantities of sulphate of copper and alum, and then after incineration examined for the bases.]

These analyses were all performed in the same way, in similar vessels, and with measured quantities of the reagents; the same quantity of each of the reagents was treated like the substance under examination, for the avoiding mistakes, and for comparison.

The following table gives the result of the analyses :—

No.	Date, 1855.	Weight in ozs. of 4 cent loaf.	Per centage of		REMARKS.
			Dry bread.	Ash.	
1	January 26,	10.4	64.5	1.29	Pure bread.
2	" 27,	9.78	64.25	1.54	Saleratus—magnesia.
3	" 29,	12.65	61.8	0.89	Saleratus—magnesia.
4	" 12,	10.12	56.69	0.79	Principally the crumb.
Id.	" 15,	9.87	62.8	1.11	No. 4 was the bread used for the preliminary experiments. It was perfectly pure with the exception of some magnesia, which I am not certain, from its quantity, whether it was purposely added.
Id.	" 22,	9.9	63.5	1.28	
Id.	" 24,	9.4	63.05	1.05	
Id.	" 25,	9.9	63.2	1.29	
Id.	" 30,	9.98	63.0	1.13	
Id.	February 1,	9.44	63.4	1.22	
Id.	March 5,	9.78			
Id.	" 5,	10.1	61.9	1.25	
5	January 19,	11.25	64.95	1.19	} Alum found in this bread in two samples.
Id.	" 31,	10.06	64.06	1.37	
6	February 2,	8.6	59.5	0.89	Copper detected.
7	" 3,	8.0	63.1	1.42	Saleratus—magnesia.
8	" 5,	10.47	63.3	1.29	This was the finest bread of the lot and perfectly pure.
9	" 6,	10.91	65.5	1.62	Much magnesia.
10	" 7,	10.4	61.8	1.26	Saleratus—magnesia.
11	" 8,	11.34	62.0	1.36	Saleratus.
12	" 9,	10.35	63.8	.08	Saleratus.
13	" 10,	9.8	63.9	1.33	Saleratus.
14	" 12,	9.49	61.1	1.36	Magnesia.
15	" 13,	11.32	64.2	1.39	Saleratus—magnesia.
16	" 14,	10.49	63.9	0.75	Saleratus—magnesia.
17	" 15,	10.94	61.5	1.26	Alum and saleratus.
18	" 16,	10.64	63.95	0.97	Saleratus.
19	" 17,	11.1	62.5	1.21	A little saleratus.
20	" 19,	8.69	64.45	1.13	Saleratus.
21	" 20,	10.40	62.05	0.89	Saleratus.
22	" 21,	9.45	65.9	1.19	Saleratus.
23	" 22,	12.43	63.0	1.28	Saleratus.
24	" 23,	9.72	65.1	0.76	Saleratus, also magnesia.

It will be seen, that *alum* was detected in Nos. 5 and 17, and copper in No. 6.—*Journal of the Franklin Institute.*

RESEARCHES ON ACONITE.

By PROF. SCROFF, (of Vienna.)

Prof. Scroff arrives at the following results, viz :—

1st. All the varieties of aconite having a blue flower, may be reduced to two principal species, viz: *Aconitum napellus*, *Lin.*, and *Aconitum variegatum*, *Lam.*, which comprises *Aconitum cammarum*.

2d. The plants belonging to *Aconitum napellus* and its subspecies are much more active in all parts than those which are

attached to *A. variegatum*. This applies to the wild plant as well as to the cultivated, whatever be its place of growth.

3d. The wild plants of either species, contain more of the active principle than the cultivated plants. *A. storckianum*, cultivated by M. Reichenbach, in gardens, had but a slight activity as demonstrated by the physical properties of the fresh and dried plant, and especially by physiological experiments.

4th. All parts of the plant are active; nevertheless, the root is the most energetic, young or old; then comes the herb before flowering; and the seeds which are least active.

5th. The herbaceous portion of the aconite plant, has the most energy just before the latest flowers, yet at that time the root is at least six times more active.

6th. Carefully dried, and kept from contact with moist air, the herb preserves its activity a long time, if it has a fine green color; but if it is moist, it loses its activity, and acquires by drying a dirty color.

7th. Extracts obtained by the inspissation of the fresh juice are a great deal less active than the alcoholic extracts, which represent all the activity of the plant, and it may be said that the aqueous extract is found to bear relation to the alcoholic in this regard as *one to four*.

8th. Aconitine represents the narcotic property of aconite, but this contains, besides, an acrid principle which has not yet been isolated, and which exists in sufficient quantity to cause an inflammation, to a great extent, of the alimentary canal. Aconite consequently merits to be placed among the acro-narcotic medicines and poisons.

9th. Aconite in general, and especially aconitine, applied exteriorly on the eye, or given internally in sufficient quantity, produces a dilatation of the pupil, a result in opposition to the opinion generally held by pharmacologists.

10th. Aconite as well as aconitine, given internally, appears to have a special and elective action on the trigeminal nerve; they produce in all parts animated by the ramifications of this nerve, peculiar and often painful sensations.

11th. Aconite and aconitine, given in sufficient quantity, produces in a healthy man and in the rabbit an extraordinary augmentation of urine.

12th. Aconite and aconitine exert a strongly depressing action on the heart and on the large vessels, either immediately or following a short acceleration of the movement of the heart. This effect is continued, and differs consequently from that observed from atropia and daturia, which, given in doses larger than aconitia, causes an acceleration of the pulse much beyond the normal state, but preceded by a short slackening.—*Repertoire de Pharmacie, Aout, 1854.*

ON HOWARDIA FEBRIFUGA.

By H. A. WEDDELL.

Among the genera published in the monograph of Cinchonas, there was one, to which, by mistake, I applied a name belonging to a plant of a different family. To avoid this reduplication, I have attached a new name to my plant, and have, as it appears to me, done but an act of justice to an excellent quinogist, who has published in England, a judicious and profound treatise on the Cinchonas, collected by José Pavon and devised by Lambers to the British Museum.

I propose then that the genus described by me, under the name of *Chrysoxylon*, should now bear that of *Howardia*, in honor of Mr. J. Elliot Howard.

I collected the specimens which form the foundation of this genus, in the Bolivian province of the *Cordillera*, during my journey from Santa Cruz to the Sierra Tarija. While searching for the trees producing the Cinchona barks, the curate of Gutierrez, capital of that province, offered to show me one of these plants, which, he told me, grew in the neighboring forest. I followed him with eagerness, and we soon reached the place where he supposed he had seen it, but it was not to be found. I pointed out to him a tree of the same family as the Cinchona, as perhaps the one meant, which conjecture was soon verified, by his expression of astonishment at my art of divination. The tree had unfortunately, some time since, lost its flowers; its fructification was at the same time so far advanced, that I could collect some aborted seed only, which led me into error as to the tribe to which the plant belonged.

A more recent examination of the subject, by calling my at-

tention to some of the Rubiaceæ with capsular fruit, which I had before neglected, revealed to me the true affinities of *Howardia*, of which the absence of flowers had caused a misconception. I became certain that my plant was congener of that described by De Candolle, under the name of *Calycophyllum tubulosum*; that species and mine not only being generically distinct from *Calycophyllum*, but properly belonging to another tribe.

HOWARDIA.—*Chrysoxylon*, Wedd.; *Hist. Nat. Quing.* 100. *Calycophylli* spec., D. C. Prodr. iv. 403.

Trees and shrubs of tropical America.

Howardia febrifuga.

Chrysoxylon febrifugum, Wedd.; *Hist. Nat. Quing.* p. 100. A tree of from ten to sixteen feet in height, and two and a half to four inches in diameter. Its bark externally (dried) with a cork-like epidermis, sulcate clefts, and a grayish brown color, internally of an intense yellow.

Found in the province of Bolivia called *Yungas*, and in the vicinity of *Santa Cruz de la Sierra*.

Mr. Howard has met this bark in commerce in England, and presented specimens to the Museum of Natural History of Paris. It is in the form of small scale-like plates deprived of epidermis, of four to five centimetres, (1.375 to 1.769 in.) by one to two millimetres, (.03937 to .07874 in.) in thickness; the pieces are of yellow, approaching orange within, where their surface is fibrous, and exhibit, externally, a vinous color and somewhat cellular surface. Mr. Howard has examined it chemically, and established the presence of a new alkali, to which we may give the name of *howardin*.

The bark treated by this experienced operator furnished him a brownish yellow powder, 40 parts of which dissolved in 100 of boiling water; the decoction, which was a golden yellow, became clouded by cooling. A small quantity of starch was detected in it. In the clear liquor there was found ten per cent. of the weight of the bark of coloring matter united with lime, one per cent. of gum and one per cent. of an alkali soluble in ether, restoring to blue the reddened vegetable blue, and finally soluble in acids, from which it was precipitated by alkalies in the form of hydrate, similar in appearance to cinchonine. In no

other respect, however, did it appear to agree with the alkalies of the true cinchonas; and when submitted under the microscope to the tests pointed out by Herapath, it exhibited none of the remarkable peculiarities which are noticed with quinia, cinchonina and quinidia. The acetate crystallized under the microscope, but exhibited no phenomena of polarization.

It is not, however, to this alkali that the bark of *Howardia* owes its medicinal properties, but rather to another substance which forms nearly twelve per cent. of the weight of the barks. This is soluble in alcohol, but not in ether; has a feeble alkaline reaction, and seems to be combined with a very characteristic coloring matter; a coloring matter which may be united to oxide of tin, and which, when isolated by sulphuric acid, forms with alcohol a brilliant yellow solution, becoming brown by evaporation and exposure to the air. In the latter case it undergoes a true oxidation, and gives rise to phenomena which indicate the presence of several different substances. There appears, however, to be one only which produces, in its different stages of oxidation, all the different shades between golden yellow and brown black, which is remarked in this bark. The sixty parts of the bark which were insoluble in boiling water, when treated by ammonia yielded about one-tenth of its weight, and the residue boiled in water and hydrochloric acid, furnished, in addition, four parts of coloring matter in combination with lime.

The woody matter remaining gave, by incineration, a considerable proportion of lime and magnesia, with some traces of potassa and soda.

The alkali and the bitter principle appear to have the same relations as biberine and siperine from the Greenheart bark, (*Nectandra Rodiei*.) It may, perhaps, be that the bitter principle is a compound, a fact which it is not yet possible to determine on account of the small amount of the bark which has been submitted to examination. The taste of the alkali is bitter, with an after taste of astringency which is likewise found in the other principle.—*Ann. des. Scien. Nat.* iv. Ser. t. 1, No. 2.

ON ORGEAT SYRUP.

By M. CAPDEVILLE.

Take of Sweet almonds,	500 grms.	=	16 ounces Troy,
Bitter almonds,	250 "	=	8 " "
Sugar,	3000 "	=	96 " "
Water,	1600 "	=	51½ " "
Distilled cherry laurel water,	15 "	=	½ a fluid ounce.
Distilled orange flower water,	230 "	=	8 " "
Exterior rind of lemons,			No. 3.

The almonds are blanched and reduced to a fine paste in a marble mortar, adding, during the process, one twelfth of the water and 16 ounces of sugar. This operation terminated, the author makes an oleo-saccharum, by bruising the lemon rinds with 16 ounce more of the sugar. He then incorporates this oleo-saccharum little by little with the paste, adds the remainder of the water with trituration, strains with strong expression, and adds to the emulsion the remainder of the sugar, and dissolves it at a temperature which should not exceed 104° Fahr., so as to avoid the coagulation of the albumen. Finally the distilled waters are added, immediately after straining:

Remarks.—It is important that the rind of the lemons be deprived of their parenchyme, because the citric acid it contains will coagulate a part of the albumen in the syrup, and injure its consistence. With the proportions above indicated, and with the distilled waters added, the author has always obtained a very emulsive syrup, which keeps well without separating.—*Repertoire de Pharmacie, Janv., 1855.*

PREPARATION OF ANILINE.

By M. A. BECHAMPS.

The author believing that this artificial alkaloid will, ere long, become a therapeutic agent, and interesting therefore to pharmacutists, offers the following formula of M. Bechamps, for its preparation, which is both economical and elegant.

Into a spacious retort, introduce 1 part of nitrobenzile, 1.2 part of iron filings, free from rust, and 1 part of strong acetic acid, free from mineral acid. The quantity of acetic acid should be such that the iron will be completely submerged. Very

soon, without heating, the reaction commences and becomes very active, the temperature rises, the liquid enters into ebullition, and all would be lost but for the refrigerated receiver, which should previously be attached. The result of the reaction is aniline, acetate of aniline, and a little nitrobenzile, that escapes reaction. When the retort has cooled, the contents of the receiver are returned to it. Heat is then applied, and distillation continued to dryness, aniline continuing to pass until the last moment, which can be proved by the blue coloration, occasioned by chloride of lime when brought in contact with it.

To the distilled product, add an excess of concentrated solution of caustic potassa; hydrated aniline separates and comes to the surface, and is deprived of moisture in the usual manner. The base is thus obtained sufficiently pure. It becomes a solid mass with muriatic and chlorohydric acids, if moderately concentrated, and the salts obtained dissolve completely in water.

This method of preparing aniline will permit it to be made in an illustrative course, and thus demonstrate the instantaneous passage of nitrobenzile to the condition of a powerful base.

The author suggests that it is hardly necessary to state, that acetate of iron affords an easy means of distinguishing oil of bitter almonds, which has been adulterated with nitrobenzile, from the pure oil.—*Repertoire de Pharmacie*, 1855.

FALSIFICATION OF CREAM OF TARTAR WITH SUGAR OF MILK.

By M. G. BLENGINI.

The author, after giving a general view of the adulterations which have been heretofore noticed in this drug, states, that his attention was directed to a sample of cream of tartar, of very beautiful appearance, which was considered to be of the best quality. It was in the form of a white powder, inodorous, cracking under the teeth, and having an acid slightly sweetish taste.

In trying the solubility of this salt in cold water, its impurity was readily inferred from the smaller quantity of that fluid required for its solution, viz., 97 parts instead of 184. Treated with arsenious acid, this cream of tartar was colored brick-red, and yielded mucic acid by the action of nitric acid; these tests,

in connection with its sweetish taste and greater solubility, led to the detection of its identity with sugar of milk or lactine.

M. Blengini observes, that the cost of cream of tartar is to that of sugar of milk as 425 to 195, and hence the reason of its employment.—*Giornale di farmica, &c., di Torino, and Repert. de Pharm.*

REMARKS ON ASCLEPIAS VERTICILLATA, AS A CURE FOR THE BITES OF VENOMOUS SNAKES AND INSECTS.

By JAMES C. HARRIS, M.D., Wetumpka, Ala.

This plant, more familiarly known in this vicinity as snake weed, or *Fitzpatrickana*, may generally be found growing in a light grey or red soil, upon the uplands, throughout the States of Alabama, Mississippi, Arkansas and Missouri, and in some portions of Georgia, Louisiana and Florida. It flowers throughout the months of July and August, and may be readily found in the above localities where the forest growth is scrubby oak and hickory, or in the pine barrens among the white oak runners. It has a succession of white flowers from an eighth to a quarter of an inch in length; *each one resembling almost exactly the tooth of a snake*. It is perennial, and varies in height from 15 inches to two feet, with a fibrous root and jointed stem.

[The following specific description is taken from Eaton's Botany, viz: "*Asclepias verticillata*, Michaux. (Dwarf milk weed, flowers green and purple and white, blooms in July), stem erect, very simple, marked with lines and small pubescence; leaves very narrow linear, straight, glabrous, whorled, scattered; horn of the nectary exsert.—ED. AM. JOUR. PHARM.]

Dr. Harris observes that this plant was first introduced as a cure for snake bites in Pike County, Alabama, in 1824, by Caldwell Eastis, a white man, who had resided with the Choctaws, Cherokees and Creek Indians for forty years preceding, who taught him its value in the year 1804-5 when he first witnessed its effects on a horse bitten by a rattlesnake. The usual manner of preparation and administration is as follows: Take and slightly bruise five or six of the entire recently gathered plants, (stem, top and roots) put them in a pint of spring water or sweet milk, and boil down to three gills. This is the ordinary dose for an adult, and is diminished proportionably for children, and

given three times a day. The first dose generally gives immediate relief, and the others are merely given by way of precaution. After the dose is swallowed the remaining boiled plant is to be applied to the bitten part as a cataplasm.

The immediate effect on the system appears to be that of a powerful *anodyne sudorific*, arresting the nausea and vomiting, and giving instantaneous relief to the pain, to be speedily succeeded by free perspiration and gentle slumbers. Shortly after swallowing a dose, an agreeable sensation of warmth is felt throughout the entire frame, commencing in the region of the heart and extending to the surface and extremities. The stomach, no matter how irritable, scarcely ever rejects the remedy, and if it does never more than once or twice.

Dr. Harris states that it has been used in *forty* cases of snake bite in his neighborhood with entire success, and that it proves equally successful in *spider* bite. He hence infers that it would prove successful as an antidote to all animal poisons, even "*hydrophobia*."—*Southern Medical and Surgical Journal*, July, 1855.

ON THE SPONTANEOUS DECOMPOSITION OF BELLADONNA LEAVES.

BY NORBERT GILLE.

It is well to observe, says M. Gille, that the leaves referred to in the following observations were not old, but had been collected and dried according to the rules of our art, and had been placed afterwards in a glass stopped bottle, among the drugs, and had been often opened in the course of business, and doubtless not always hermetically closed.

Well dried at first, these leaves gradually reabsorbed humidity every time the bottle was opened as long as the hygrometric state of the external air exceeded that of the bottle. Under the influence of this moisture a reaction soon commenced, a mixed odor of mould and ammonia occupied the interior of the bottle, and then moist reddened litmus paper, suspended in the air of the bottle, is quickly changed to blue, and a rod moistened with chlorohydric acid held to the mouth of the bottle gives off abundant white vapors of muriate of ammonia.

This production of ammonia depending on nitrogenous principles in the leaves, of which atropia is one, this alkaloid should disappear in part or altogether, as it is known to change easily into ammonia and another odorous base, very soluble in water (the atropine of Berzelius), when placed under similar conditions. For the rest, when belladonna leaves putrify like other organic matters,—and the instance above is a commencement of putrefaction,—it is probable that the alterations which then occur do not respect the salts of atropia, and even if they did, the changes which have supervened must injure the medicinal quality of the drug.

The author believes that these alterations occur frequently in the shop without its being perceived, because the leaves are not preserved in close vessels so as to retain the gases that may develop. He also believes that similar metamorphoses supervene during the desiccation of leaves when the process is effected too slowly, and incipient fermentation ensues.—*Repertoire de Pharmacie*, Feb., 1855.

WOORARA, OR SOUTH AMERICAN ARROW POISON.

BY JOHN W. GREEN, M. D.

Dr. J. W. Green, of New York, in a long letter in the New York Medical Gazette for July, gives an account of this poison, and of a series of experiments made with it by himself and Dr. Brainard, at Paris, proving that iodine possesses antidotal powers when brought in contact with this poison in a wound.

De la Condamine, on his return from South America, in 1745, brought this poison to the notice of the French Academy, and was assisted by Van Swieten in studying its effects at Leyden. It appears to be “an extract made of the juices of certain plants,” and that made by the Ticunas is said to embrace thirty varieties.

Bancroft, in 1769, obtained the following recipe from the Accawan tribe of Indians, which would be rather difficult to compound, viz:

Take of the bark of the root Woorara	-	6 parts.
“ “ “ Worracobba	-	2 “
“ “ “ Couranopi		
“ Bakiti and Hotchyboly, each		1 “

These are finely scraped, put into a pot, covered with water, then placed over a slow fire. When it has simmered for a quarter of an hour, the juice is to be expressed by the hands, taking care that the skin be unbroken. The bark being now useless, is thrown away, while the juice is evaporated, by means of a moderate fire, until it has acquired the consistence of tar. These Indians now take flat pieces of wood, called Cokarito, and dip them into the mass, which adheres strongly when cold. In order to preserve them, they are placed in hollow canes, closed at both ends by skins. When wanted for use the poison is dissolved in water and the points of the arrows moistened with the solution.

Dr. Green first used a specimen obtained from M. Flourens by Prince C. L. Bonaparte, at his request. The second lot, and which was chiefly used, came about 1835 from Mr. Smith, U. S. Consul at Para, to Dr. Green. It was in a small half-pint gourd, which was about half full of a solid, black or brownish substance, having a resinous aspect, and soluble in water and alcohol to a certain extent, facilitated by heat. It was kept in New York without special care, as a curiosity, until in 1853 Dr. Green, then in Paris, obtained a quantity for experiments. M. Vulpian, of Paris, also used some of this specimen and found it very active.

The opinion which had obtained, that woorara was not a poison when introduced into the stomach, has been, in part, disproved by Dr. Green and others, although its action is less rapid in that way than by direct introduction into the circulation.

The experiments of Drs. Brainard and Green were made with guinea pigs and pigeons. They found a centigramme (1-7th of a grain) would kill a pigeon, and two and a half centigrammes a guinea pig, in three minutes.

The preparation of iodine used as a counterpoison was iodine one part, iodide of potassium *two* parts, water 48 parts. This mixture, after being heated to the temperature of the body, was injected under the skin of the animals mentioned without any ill effects. When a poisonous quantity of the solution of woorara was mixed with five times its bulk of this iodine liquid, the whole was injected under the skin of a guinea pig without its causing any ill effects.

From the numerous experiments detailed, the authors draw the following conclusions :

1st. That the solution of iodine and iodide of potassium is in certain limits a perfect antidote against the woorara ; mingled with this poison in solution it destroys its venomous effects.

2d. The solution of iodine injected immediately after the solution of woorara, neutralizes completely the poisonous effects, provided that a cup is applied, in order to arrest the circulation long enough to permit the iodine to join the poison. It does not produce suppuration, nor loss of substance by gangrene.

3d. The iodized solution applied upon the surface of a deep wound of the muscles, into which has been introduced the woorara, destroys the effect of the poison.

New York Medical Gazette, July, 1855.

ON THE PREPARATION OF RENNET AND WHEY.

By M. BOURGAREL, Pharmacien, &c.

Since the year 1823 that I have pursued pharmacy, I have experimented with all the known processes for making whey with acetic, citric, tartaric and sulphuric acid, &c., but none of them has afforded me results so satisfactory as that made with rennet, and after this long experience I now publish the following formula :

Rennet.

Take of Dry White Wine (Sherry or Madeira) 1 litre.

Common Salt, pulverized . . . 12 grammes.

Rennet of the kid, calf, or lamb, dried

and cut in small pieces . . . 15 grammes.

Macerate them for at least fifteen days, and agitate them from time to time, and filter into several bottles, which should be well filled and closely stopped, for use.

When put in a cool place, this rennet can be preserved during two years. I have never attempted to keep it longer.

Whey.

Take of Fresh Cow's or Goat's Milk . . . 1 litre.

Rennet solution, as above . . . 12 grammes.

Mix. In spring or summer the milk is immediately curdled, but if it is winter and cold, it is necessary to warm the milk

slightly, else it will not coagulate; or what is better, warm the mixture of milk and rennet gently.

On the other hand—

Take Cream of tartar	2 grammes.
Sugar	12 “
Dried albumen	2 “

(or better, half the white of an egg.)

Put the curded milk in a saucepan, cut it up with a spatula, and, by means of a gentle fire, heat till the casein separates from the serum, which requires about 104° Fah. The whole is thrown on a strainer or cullender to drain. The crude whey is then put in a silver or well cleaned copper vessel, the particles of casein that float removed with a skimmer, and then heat by a quick fire, add the sugar, and when nearly boiling introduce the cream of tartar, and after it rises throw in the albumen, previously beaten with a little cold water or old whey; allow the liquid to boil up a second time, and then immediately remove it from the basin to a filter previously moistened with boiling water.

Repertoire de Pharm., Mai, 1855.

AN INVESTIGATION INTO THE FACTS AND THEORIES OF FERMENTATION AND PUTREFACTION.

By Henry Pemberton, Practical and Analytical Chemist.

[The above essay appeared in the May number of the Medical Examiner, but being too voluminous for transfer to our pages entire, we give an extract which more particularly embraces the experimental observations of the writer.—ED. AM. JOUR. PHARMACY]

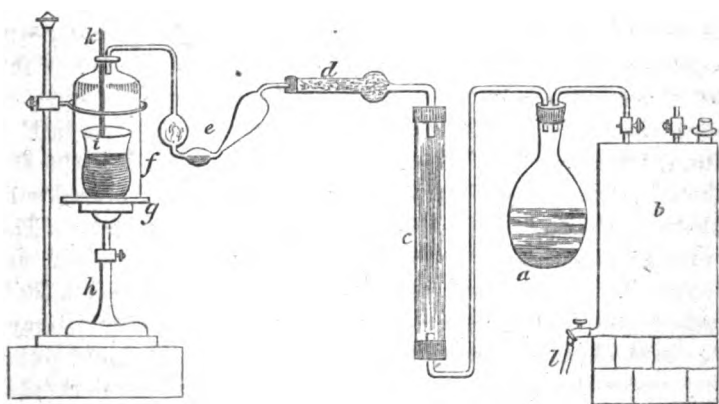
Schröder and Von Dusch* have lately given the details of experiments tried by them upon the effects produced by filtered air upon fermentation, etc. They have established the fact, “that when air is passed through a tube filled with raw cotton, moderately compressed, it becomes incapable of inducing fermentation or putrefaction in substances that would rapidly un-

* Liebig's Annalen, 1854, and Medical Examiner, June, 1854.

dergo these changes if common air was substituted. Thus, meat, broth, wort, etc., were preserved for weeks in flasks, in which they were boiled, a constant current of filtered air being drawn through the flasks. No change of any kind was perceptible, even in summer weather. When milk was tried in the same manner, however, it became sour nearly as soon as in the open air, thus indicating an essential difference in the principles involved in the respective decompositions." The author has himself repeated the experiment of preserving boiled meat and water in a flask, having an aperture of at least one inch diameter, closed merely with a plug of raw cotton, part of the cotton being formed into a ball, surrounding the neck of the flask, and confined with a thread, to prevent the passage of air between the sides of the aperture and the plug of cotton. Meat broth, thus prepared, was found to be perfectly sweet and unchanged in every respect, after the lapse of six weeks, in the months of June and July; a portion of the same broth placed in a bottle with a glass stopper, became so offensive on the third day as to require its removal.

These results above mentioned, appearing to establish the theory, that all fermentations, etc., are induced by the presence in the air of the germs of organic life, led the author to make the following experiments, with the two-fold purpose; 1st, of deciding whether this property possessed by cotton was peculiar to it alone and due to its structural arrangement, or whether it was common to it and to all other finely divided substances; and 2d, the hope of detecting in the air these invisible germs, or at least of obtaining satisfactory proof of their existence. The apparatus made use of was essentially that of Schröder and Von Dusch, with merely such alterations as the purposes in view required. It consisted of the flask *a*, of about one quart capacity, in which was placed the liquid experimented on, closed tightly with a cork, through which passed two glass tubes, one connecting with the five gallon tin cannister *b*, the communication with which could be intercepted at pleasure by a stop-cock, the other leading to the lower end of the filter tube *c*, a glass tube, $1\frac{1}{2}$ inches in diameter and 18 inches long, closed at both ends by corks; a diaphragm of fine copper wire gauze was placed a little

above the lower cork ; through the upper cork was inserted the bent limb of the drying tube *d*, containing fragments of dried chloride of calcium, the other end of the drying tube, connected with the nitrogen bulb or washing apparatus *e*, containing about $\frac{1}{4}$ ounce of water ; from this a tube passed to the bell glass *f*, through the cork at top, through which also passed another straight tube *k*, reaching to the centre of the bell glass, for the purpose of admitting air. The bell glass was closed at the bottom by a plate of ground glass *g*, supported upon a sliding support *h*, kept at any desired elevation by a set screw ; within the bell glass was placed a beaker glass *i*, resting upon the glass plate *g*, so that it could be removed at pleasure. Into this beaker glass was poured an infusion of malt, (wort,) similar to that in the flask *a*. The tin cannister *b*, was provided with an opening through which it could be filled, and capable of being closed air tight ; at the bottom was a discharge cock *l*, leading into a suitable receiver. It is evident that, if the joints of the apparatus are all closed air tight, (the cannister being filled with water,) and the cock *l* opened to permit the escape of the water, a current of air must enter through the tube *k*, into the bell glass *f*, and from thence pass through the washing tube *e*, the drying tube *d*, the filter tube *c*, and the flask *a*, containing the experimental liquid, and finally into the cannister *b*, supplying the void created by the escape of the water. The substance selected for



the filtering medium was pure white sugar, in grains of the size

of fine sand, all coarser and finer particles being removed by sieves of different sizes. It was chosen as being better adapted to this purpose than nearly any other substance, being readily obtained pure and clean, possessing an uniform composition, ready solubility and absence of color; it could also be heated to 212° F. without injury to its physical properties. The washing tube and water were used to prevent any organic matter, dust, etc., being mixed with the sugar in the filter tube, the presence of which might lead to errors in the subsequent examinations. The air was dried after leaving the water by the chloride of calcium, in order that no possibility might exist of the germination of the sporules favored by the moisture, that would otherwise be carried into the sugar, and which, if it had taken place, might cause them to vegetate, and thus transmit the germs from particle to particle, until finally carried over by the air into the flask *a*.

On the 30th Nov., 1854, $\frac{1}{2}$ pint of warm ale wort, fresh from the brewery, was put into the experimental flask *a*, and about six ounces of the same into the beaker glass *i*, about the same quantity also poured into a bottle and left exposed to the air. The filter tube was now filled with the sugar, previously heated in an air bath to 212° for 30 minutes. The joints now being made air tight, the contents of the flask *a* were brought into ebullition, which was continued until the tubes leading to the filter and to the canister were heated throughout. The stopcock *l* was now opened, and the water permitted to escape drop by drop, the air entering through the tube *k*, and passing through the whole apparatus to replace it. The water was allowed to run out at the rate of four gallons in 24 hours, being renewed once a day; of course the same quantity of air would pass through the flask *a* within that time; the temperature of the room 65° F. On the 4th of December the liquid in the open bottle was covered with bubbles, and a very thin pellicle formed on the surface. The contents of the flask *a*, and of the beaker glass *i*, remained unaltered. Dec. 5th. The liquid in the beaker glass showed a little mould on the surface. Dec. 6th. The mould was very perceptible in the beaker glass; a few globules were visible in the liquid when under the microscope. Dec. 9th. The liquid in the beaker glass had apparently passed through the alcoholic fermentation and become very acid, smelling strongly of vinegar; it was full

of vibrios and covered with a thick mould. The experiment flask *a*, remained perfectly clear and with no appearance of mould or fermentation. The air was drawn constantly through the apparatus, in the manner described, from the 30th of November until the 23d of December. It was then allowed to remain at rest until the 25th of January, 1855, no appearance of decomposition having occurred in the flask *a*; the washing and drying tubes *c* and *d* were disconnected, so that the air entered from the atmosphere immediately into the filter tube; this was done to make certain that the effects produced were not caused by the water or by the chloride of calcium. The air was now again drawn through as before, on alternate days, until February 26th, when the operation was concluded. On examining the water in the washing vessel *e*, it was found to be reduced by evaporation to about one drachm; it was perfectly colorless and transparent; suspended in it, however, there was a flocculent mass of the size of a pea, colorless and resembling very fine raw cotton; it was possessed of great tenacity, although of the most delicate structure. Under the microscope, the liquid was found to be filled



with extremely minute circular globules, requiring great attention to distinguish them, resembling the globules of the *Penicillium glaucum*, although much smaller. The flocculent mass above mentioned was resolved into a vegetation of the utmost beauty and regularity, consisting of extremely delicate fibres interlacing with each other and covered in parts with sporules and globules. The plant resembled somewhat the *Penicillium glaucum*, but was far more delicate in its structure, and did not appear composed of globules extended longitudinally, forming cells, as is the case in the latter.

When a portion of the clear washing liquid was placed in a bottle with 10 per cent. of fresh sugar, a new flocculent deposit formed in a few days, possessing the general characteristics of that above described. A portion of the sugar from the top of the filter was next examined, but the most rigid scrutiny failed to detect any organic structure, either in the sugar in grains or in the solution obtained by dissolving it in 10 times its weight of distilled water. Another portion was then dissolved in the same amount of water, and placed aside for several weeks, but no trace of globules or other organisms could be found. The examinations and drawing were all made with a Powel & Leland's microscope, $\frac{1}{8}$ in. objective, and highest power of eye piece, giving a magnifying power of about 800 diameters.

When the flask *a* was opened, on the 26th of February, it presented all the properties of the original wort, being perfectly sweet, having a very slight acid reaction, and the odor and taste of fresh wort. On being subjected to distillation, the distillate obtained was neutral, possessed the character and smell of fresh wort, and, by treatment with bichromate of potash and sulphuric acid, proved the entire absence of alcohol. During the whole time this experiment was proceeding, the temperature was never below 65°, sometimes 75°, averaging over 70°.

At the completion of this experiment, a small clean bottle was filled with the still sweet wort from the flask *a*, and tightly corked. The next day it was found covered with froth and in brisk fermentation. The remaining contents of the flask were left therein, and closed with the cork through which the two glass tubes passed, thus affording an uninterrupted communication with the atmosphere through the tubes. At the end of the week

the liquid was but little changed, having merely a musty smell; no mould was perceptible. The flask was now agitated, to expel the air contained therein and replace it with fresh air; the next day it was found covered with a thick growth of *Penicillium glaucum*, was strongly acid, had a putrid odor, and underwent rapid putrefaction.

On the 23d of November, one week previous to the above mentioned experiments, a portion of wort was placed in the apparatus, arranged as just described, the conditions being exactly the same as in the last experiment, excepting that the sugar was not heated previously to being placed in the filter tube. On the fourth day of the operation fermentation commenced, alike in the beaker glass and in the experimental flask *a*; a thick formation of mould covered the liquid; the process was then interrupted and commenced anew as previously described.

This result clearly indicates that there is contained in the sugar, as met with in commerce, a substance capable of being taken up by a current of air passing over or through it, and possessing the property, while thus suspended or dissolved in the air, of producing fermentation and the growth of mould in fresh wort; this property, however, being destroyed by a temperature of 212° F. The author believes that sugar possesses this property in common with all matter, organic and inorganic, that is not destructive to vitality. The action of cotton is due, therefore, simply to its finely divided condition, and not to any peculiarity in form or composition. The germs floating in the air being deposited or taken up again, precisely as finely-divided dust would be under the same conditions.

It is not probable that the globules found in the washing water are the germs of the plants causing fermentation, etc. It is more likely that they are the partially-developed globules, having a magnitude many times greater than the actual germ that is suspended in the air and distributed through all nature. The cryptogamia found in their full development, and the innumerable globules present, had doubtless been nourished and attained their present size by the volatile matters given off by the fermenting liquids in the beaker glass *i*, and a portion of which must have been absorbed in their passage through the water. The true original germs are without doubt contained in the su-

gar in the filter, but being absolutely without nitrogenous materials for their growth, even when the sugar is in solution, they remain in their pristine state.

ON THE ANÆSTHETIC PRINCIPLE OF THE LYCOPERDON PROTEUS AND CERTAIN OTHER FUNGI.

By THORNTON HERAPATH, Esq.

The smoke of the puff-ball, it is well known, has been long employed in some parts of the country, by apiarists, for stupefying bees. In a paper "On the Anæsthetic Properties of the *Lycoperdon proteus*, or common Puff-ball," which was read before the Medical Society of London in 1853, Mr. R. W. Richardson called particular attention to this fact, and stated that the fumes of the burning fungus produced the most perfect anæsthesia, not only in insects, but also in dogs, cats, rabbits, and probably in all the larger animals, and might consequently be applied as a substitute for the vapor of chloroform and ether in producing insensibility to pain in surgical practice. With the assistance of Dr. Willis, he said, he had removed a large tumor from the abdomen of a dog that had been placed under the influence of the narcotic, without any sign of pain being exhibited by the animal during the operation. From this gentleman's experiments it appeared, that when a moderate quantity of the fumes was inhaled slowly, the narcotism came on and passed off slowly, the animal exhibiting all the symptoms of intoxication, with convulsions and sometimes vomiting; but that when they were administered in larger quantity, life was invariably destroyed. The consideration of these and other facts induced Mr. Richardson to conclude, that the peculiar effects that were produced by the inhalation of the smoke of the puff-ball were caused by a volatile narcotic principle contained in the fungus, which was liberated by the action of heat, but was not absorbable by water, alcohol, or a strong alkaline solution. What the exact nature of this principle was, however, he confessed himself to be unable to determine. About eight or nine months ago I carefully repeated Mr. Richardson's experiments, and after making several futile attempts, at last, I believe, succeeded in isolating the narcotic constituent of the smoke.

The first step I considered it necessary to take in the investigation, was to determine in what part of the fungus the anæsthetic ingredient was contained; that is to say, whether in the sporules, the cellular tissue, or the matters soluble in water. I accordingly digested two or three ounces of the fungus, previously torn up into small pieces, in moderately warm water, and by means of pressure and washing, separated the sporules and soluble constituents from the cellular matter. Then, by allowing the water that had been used in this operation to remain undisturbed for several hours, the sporules were collected in the form of a dark brown-colored, muddy deposit. This was well washed once or twice with water, and dried in an oven, as was also the cellular matter, and the watery solution was evaporated to dryness. On testing these three substances, it was found that only two of them, namely the sporules and the cellular tissue, were capable of producing anæsthesia; the aqueous extract evolved a thick irritating vapor, but this did not occasion insensibility on inhalation.

It was clear, therefore, that the narcotic principle should be looked for in the two former. Accordingly, small portions of each of them were digested for several hours in boiling alcohol, ether, bisulphide of carbon, wood-spirit, diluted sulphuric acid, and fusel oil, but in every instance the residuary matter, when pressed and dried, was found to retain its original narcotic quality. Fresh quantities were then soaked for a considerable period in hot alkaline lye, and in a hot solution of moderately strong nitric acid, until nothing further was dissolved out by either of the reagents; the insoluble portion was well washed with water, and again dried in an oven. On this being tested as before, anæsthesia was found to be no longer produced.

In the next series of experiments I operated in a different way. I introduced the fumes of the burning fungus into bottles containing small quantities of liquor potassæ, dilute hydrochloric acid, alcohol, fusel oil, and diluted sulphuric acid. The bottles were then well shaken for several minutes, and the properties of the purified fumes were tested by introducing flies, bees, or wasps, secured by cement to the ends of long splinters of wood, into the bottles, and observing the effects. In every case, however, insensibility was still produced, thus showing that the narcotic quality of the fumes was not caused by any body soluble in these

solutions. There being no substance with which I am acquainted, except carbonic oxide, nitrous oxide, and perhaps some compounds of cyanogen which possess all these properties; and having, moreover, in the mean time, read a paper, by M. Adrien Chenol, "On Pure Oxide of Carbon, considered as a Poison,"* if immediately occurred to me that it was the former of the substances that was the cause of the narcotism. I therefore specially examined the fumes for carbonic oxide, by agitating them with an acid solution of chloride of copper, and also by absorbing the carbonic acid, ammonia, and oxygen, by means of lime-water, diluted muriatic acid, and a solution of the protosulphate of iron saturated with nitric oxide gas, when indications of the presence of carbonic oxide were readily obtained; the fumes, after agitation with the solution of chloride of copper, no longer induced narcotism; whilst those, on the contrary, which had been treated with the other solvents, were more than ordinarily powerful, and rendered an insect insensible much more quickly than before; they also burnt with a blue flame, and possessed all the well-known characters of the oxide of carbon. The correctness of this conclusion was, moreover, confirmed by experimenting with carbonic oxide prepared by acting on oxalic acid with oil of vitriol, and passing the gas evolved through caustic soda-ley. Even when largely diluted with air, it still continued to produce insensibility in insects, and acted in every way like the purified fumes of the *Lycoperdon*.†

It is not difficult to understand how carbonic oxide is formed by the ignition of the fungus, as this gas is invariably produced in larger or smaller quantity when certain organic substances are decomposed by heat, though some yield it in greater proportion than others; and consequently, as might have been anticipated, I find that the fumes of several other fungi act in the same manner towards animals as those of the *Lycoperdon proteus*. The principal of those to which I allude are the common *Lycoperdon* of the druggist, *L. giganteum*, and the mushroom, *Agaricus campestris*.—*Philosophical Magazine* for July, 1855.

* *Comptes Rendus*, No. 16, April 17, 1854.

† See also 'A Treatise on Poisons,' by Professor Christison, 4th edition, p. 827, for an account of the peculiar effects produced by the inhalation of the oxide of carbon.

Varieties.

On Perfumery. By SEPTIMUS PIRESSE.

(Continued from page 374.)

Besides the Sachets mentioned in the "Annals" of last month, there are many other substances applied as dry perfumes, such as scented wadding, used for quilting into all sorts of articles adapted for use in a lady's boudoir. Pincushions, jewel-cases, and the like, are lined with it. Cotton so perfumed, is simply steeped in some strong essence of musk, &c.

The lasting odor of Russia leather is familiar to all and pleasing to many ; its perfume is due to the aromatic saunders wood with which it is tanned, and to the empyreumatic oil with which it is curried. The odor of Russia leather, however, is not *recherché* enough to be considered as a perfume ; but nevertheless, leather can be impregnated by steeping in the various ottos with any sweet scent, and which it retains to a remarkable degree, especially with otto of santal or lemon grass (*Verbena*). In this manner, the odor of the *peau d'Espagne* can be greatly varied, and gives great satisfaction, on account of the permanence of its perfume.

PEAU D'ESPAGNE. (*Perfumed Letter Paper.*)

If a piece of *peau d'Espagne* be placed in contact with paper, the latter absorbs sufficient odor to be considered as "perfumed ;" it is obvious that paper for writing upon must not be touched with any of the odorous tinctures or ottos, on account of such matters interfering with the fluidity of the ink ; therefore, by the process of infection as it were, alone can writing paper be perfumed to advantage.

PERFUMED BOOK-MARKERS.

We have seen that leather can be impregnated with odoriferous substances, in the manufacture of *peau d'Espagne* ; just so is card-board treated prior to being made up into book-marks. In finishing them for sale, taste alone dictates their design ; some are ornamented with beads, others with embroidery.

Cassolettes and Printaniers are little ivory boxes, of various designs, perforated in order to allow the escape of the odors contained therein. The paste used for filling these "ivory palaces whereby we are made glad," is composed of equal parts of grain, musk, ambergris, seeds of the vanilla pod, otto of roses, and orris powder, with enough gum acacia, or gum tragantha to work the whole together into a paste. These things are now principally used for perfuming the pocket or reticule, much in the same way that ornamental silver or gold vinagrettes are used.

PASTILS.

There is no doubt whatever that the origin of the use of pastils, or pastilles, as they are more frequently called from the French, has been derived from the use of incense at the altars of the temples during the religious services:—"According to the custom of the priest's office, his lot (Zacharias's) was to burn incense when he went into the temple of the Lord." (Luke i. 9.) "And thou shalt make an altar to burn incense upon. . . . And Aaron shall burn thereon sweet incense every morning when he dresseth the lamps, and at even when he lighteth the lamps he shall burn incense upon it." (Exodus xxx.)

An analogous practice is in use to the present day in the Roman Catholic churches, but instead of being consumed upon an altar, the incense is burned in a censer, as doubtless many of our readers have seen. As soon as the signal was given by the chief priest, the incense was kindled, the holy place was filled with perfume, and the congregation without joined in prayers."—CARPENTER'S *Temple Service of the Hebrews*.

THE CENSER.

The Censer, as used in the "holy places," is composed either of brass, German silver, or the precious metals; its form somewhat resembles a saucer, and an inverted cup, which latter is perforated, to allow the escape of the perfume. In the outer saucer is placed an inner one of copper, which can be taken out and filled with ignited charcoal. When in use, the ignited carbon is placed in the censer, and is then covered with the incense; the heat rapidly volatilizes it in visible fumes. The effect is assisted by the incense bearer swinging the censer, attached to three long chains, in the air. The manner of swinging the censer varies slightly in the churches in Rome, in France, and in England, some holding it above the head. At the Madeline the method is always to give the censer a full swing at the greatest length of the chains with the right hand, and catch it up short with the left hand.

Several samples of "incense prepared for altar service," as sent out by Mr. Martin, of Liverpool, appear to be nothing more than gum olibanum, of indifferent quality, and not at all like the composition as especially commanded by our Lord, the form for which is given in full in Exodus.

The pastils of the moderns are really but a very slight modification of the incense of the ancients. For many years they were called *osselets* of Cyprus. In the old books on Pharmacy, a certain mixture of the then known gum resins was called *suffitus*, which being thrown upon hot ashes produced a vapor which was considered to be salutary in many diseases.

It is under the same impression that pastils are now used, or at least to cover the *mal odour* of the sick chamber.

There is not much variety in the formula of the pastils that are now in use; we have first the

INDIAN, OR YELLOW PASTILS.

Santal wood, in powder	1 lb.	Otto of santal	} each . . . 3 drachms.
Gum benzoin	1½ lb.	" cassia	
" tolu	½ lb.	" cloves	
Nitrate of potass	1½ lb.	Mucilage of tragacanth . . .	q. s.

to make the whole into a thick paste.

The benzoin, santal wood, and tolu, are to be powdered and mixed by sifting them, adding the ottos. The nitre being dissolved in the mucilage, is then added. After well beating in a mortar, the pastils are formed in shape with a pastil mould, and gradually dried.

The Chinese josticks are of a similar composition, but contain no tolu. Josticks are burned as incense in the temples of the Buddahs in the Celestial Empire, and to such an extent as to greatly inhanse the value of santal wood.

DR. PARIS'S PASTILS.

Benzoin	} of each	½ lb.	Otto of nutmegs	} of each	¾ oz.
Cascarilla			" cloves		
Myrrh		1½ oz.	Nitre		2 oz.
Charcoal		1½ lb.	Mix as in the preceding.		

PERFUMER'S PASTILS.

Well-burned charcoal	1 lb.	Benzoin	¾ lb.
Tolu		Otto of santal	} of each . . . 2 dr.
Vanilla pods	} of each	" neroli	
Cloves		Nitre	1½ oz.
Mucilage of tragacanth,		q. s.	

PIESSE'S PASTILS.

Willow charcoal	½ lb.
Benzoic acid	6 oz.
Otto of thyme	} of each . . . ½ dr.
" caraway	
" rose	
" lavender	
" cloves	
" santal	

Prior to mixing, dissolve ¾ oz. nitre in half a pint of distilled or ordinary rose water; with this solution thoroughly wet the charcoal, and then allow it to dry in a warm place.

When the thus nitrated charcoal is quite dry, pour over it the mixed ottos, and stir in the flowers of benzoin. When well mixed by sifting (the sieve is a better tool for mixing powders than the pestle and mortar), with enough mucilage to bind the whole together, and the less that is used the better.

A great variety of formula have been published for the manufacture of pastils; nine-tenths of them contain some woods or bark, or aromatic seeds. Now when such substances are burned, the chemist knows that if the ligneous fibre contained in them undergoes combustion—the slow combustion—materials are produced which have far from a pleasant odor; in fact, the smell of burning wood predominates over the volatilized aromatic ingredients; it is for this reason alone that charcoal is used in lieu of other sub-

stances. The use of charcoal in a pastil is merely for burning, producing, during its combustion, the heat required to quickly volatilize the perfuming material with which it is surrounded. The product of the combustion of charcoal is inodorous, and therefore does not in any way interfere with the fragrance of the pastil. Such is, however, not the case with any ingredients that may be used that are not in themselves perfectly volatile by the aid of a small increment of heat. If combustion takes place, which is always the case with all the aromatic woods that are introduced into pastils, we have, besides the volatilized otto which the wood contains, all the compounds naturally produced by the slow burning of ligneous matter, spoiling the true odor of the other ingredients volatilized.

There are, it is true, certain kinds of fumigation adopted occasionally, where these products are the materials sought. By such fumigation, as when brown paper is allowed to smoulder (undergo slow combustion) in a room for the purpose of covering bad smells. By the quick combustion of tobacco, that is, combustion with flame, there is no odor developed; but by its slow combustion, according to the method adopted by those who indulge in "the weed," the familiar aroma, "the cloud," is generated, and did not exist ready formed in the tobacco. Now, a well-made pastil should not develop any odor of its own, but simply volatilize that fragrant matter, whatever it be, used in its manufacture. We think that the fourth formula given above carries out that object.

It does not follow that the formulæ that are here given produce at all times the odor that is most approved; it is evident that in pastils, as with other perfumes, a great deal depends upon taste. Many persons very much object to the aroma of benzoin, while they greatly admire the fumes of cascarilla.

THE PERFUME LAMP.

Shortly after the discovery of the peculiar property of spongy-platinum, remaining incandescent in the vapor of alcohol, the late Mr. J. Deck, of Cambridge, made a very ingenious application of it for the purpose of perfuming apartments. An ordinary spirit lamp was filled with eau de Cologne, and "trimmed" with a wick in the usual manner. Over the centre of the wick, and standing about the eighth of an inch above it, a small ball of spongy platinum is placed, maintained in its position by being fixed to a thin glass rod, which is inserted into the wick. Thus arranged, the lamp is to be lighted and allowed to burn until the platinum becomes red hot; the flame may then be blown out, nevertheless the platinum remains incandescent for an indefinite period. The proximity of a red-hot ball to a material of the physical quality of eau de Cologne, diffused over a surface of cotton wick, as a matter of course causes its rapid evaporation, and as a consequence, the diffusion of odor.

Instead of the lamp being charged with eau de Cologne, we may use eau de Portugal, vervaine, or any other spirituous essence thought fit. So-

veral perfumers make a particular mixture for this purpose, which is called—

EAU A BRULER.

Eau de Cologne	1 pint.	Otto of thyme	} of each $\frac{1}{2}$ drachm.
Tincture of benzoin	2 oz.	“ mint	
“ vanilla	1 oz.	“ nutmeg	

Another form called

EAU POUR BRULER.

Rectified spirit	1 pint.	Otto of thyme	} of each 1 drachm.
Benzoic acid	$\frac{1}{2}$ oz.	“ caraway	
Otto of bergamot	2 oz.		

Persons who are in the habit of using the perfume lamps will, however, frequently observe that whatever difference there may be in the composition of the fluid introduced into a lamp, that there is a degree of similarity in the odor of the result when the platinum is in action. This arises from the fact, that so long as there is the vapor of alcohol, mixed with oxygen air, passing over red hot platinum, certain definite products always result, namely, acetic acid, aldehyde, and acetal, which are formed more or less, and impart a peculiar and rather agreeable fragrance to the vapor, but which overpowers any other odor that is present.

FUMIGATING PAPER.

There are two modes of preparing this article :—1. Take sheets of light cartridge paper and dip them into a solution of alum—say, alum, one ounce; water, one pint. After they are thoroughly moistened, let them be well dried; upon one side of this paper spread a mixture of equal parts of gum benzoin, olibanum, and either balm of tolu or Peruvian balsam, or the benzoin may be used alone. To spread the gum, &c., it is necessary that they be melted in an earthenware vessel, and poured thinly over the paper, finally smoothing the surface with a hot spatula. When required for use, slips of this paper are held over a candle or lamp, in order to evaporate the odorous matter but not to ignite it. The alum in the paper prevents it to a certain extent from burning. 2. Sheets of good light paper are to be steeped in a solution of saltpetre, in the proportions of two ounces of the salt to one pint of water, to be afterwards thoroughly dried.

Any of the odoriferous gums, as myrrh, olibanum, benzoin, &c., are to be dissolved to saturation in rectified spirit, and with a brush spread upon one side of the paper, which being hung up, rapidly dried.

Slips of this paper are to be rolled up as spills, to be ignited and then to be blown out.

The nitre in the paper causes a continuance of slow combustion, diffusing during that time the agreeable perfume of the odoriferous gums. If two of these sheets of paper be pressed together before the surface is dry, they will join and become as one. When cut into slips they form what are called “odoriferous lighters.”—*Annals of Pharmacy*.

Pharmaceutical Studies in Austria.—Pharmaceutical instruction is about being re-organized in Austria. Before commencing his pharmaceutical studies the student has to be qualified in the instructions of the schools (Gymnasies.) The duration of the course of studies is two years. The teaching of the first year comprehends experimental physics, mineralogy, zoology, and botany: that of the second, inorganic and organic chemistry, analytical chemistry, pharmaceutical chemistry, and pharmacognosy. The tests or examinations are three in number, two theoretical and the other practical. The first is on physics, botany, mineralogy and zoology. The practical examination consists in the preparation of two pharmaceutical products, and a chemical analysis, qualitative and quantitative, the candidate making a written report of the processes he has followed, and the results he has obtained. The second theoretical examination relates to pharmacognosy, organic and inorganic chemistry, analytical and pharmaceutical chemistry, and the police of pharmacy. Two years' practice in the shop is required.—*Repertoire de Pharm.*, Juin, 1855.

Danger of Keeping Tobacco in Lead Boxes.—It is stated in the *Annales d'Hygiene* that humid tobacco will oxidize lead, and afterwards form salts with the oxide, which, on examination, are found to be a mixture of acetate, carbonate, chlorhydrate, and sulphate of lead, of which the quantity amounts to from 6 to 30 grains for a half pound of tobacco. The presence of soluble lead salts may be discovered in bad tobacco by incinerating it, treating the ashes with nitric acid, and testing the liquid for lead by the usual tests.

Falsification of Volatile Oil of Anise with Spermaceti. By M. F. CAPDEVILLE.—Having occasion to make an aromatic tincture, I took 2 grammes of oil of aniseed and threw it into 250 grammes of alcohol. Greatly to my astonishment, an instantaneous precipitation of whitish flocks occurred, from which I concluded the oil to be adulterated.

Desirous of knowing the nature of this precipitate, I collected it, ascertained its weight to be .70 grammes, put it in a porcelain capsule, and treated it with distilled water, which was without action on it. I then decanted this liquid and applied boiling alcohol, which dissolved it completely, but allowed it to precipitate on cooling, in the form of a beautiful white solid, soft to the touch, and having all the physical characters of spermaceti. New experiments confirmed its identity with that substance, and decided its proportion to be about 35 per cent.—*Repert. de Pharm.*

On the Essence of Peppermint. By ORTLEIB.—The April number of the *Repertoire de Pharm.* contains an article on the production of essence of mint; I believe it right to give a short account of my manner of operating in the production of this volatile oil.

A little before the mint is in full inflorescence, I cut up small and dry it in the shade until reduced to three fourths of its weight. In this state I submit it to distillation in a still, in such a manner that the aqueous vapor shall traverse the plant, supported on a diaphragm, and rapidly remove the volatile oil. The process is continued as long as the distilled water is odorous, and the latter is employed for a new operation. Thus obtained the oil is greenish colored, but may be obtained colorless by careful rectification, in a glass retort with a refrigerated receiver. The product amounts to from 0.6 to 0.8 per cent.—*Repert. de Pharm.*, Juin, 1855.

Phosphorus Paste for Destroying Vermin.—The preparation and preservation of this paste, which is generally preferred to arsenical preparations, presents two serious inconveniences: the facility with which the phosphorus inflames in boiling water, and the prompt fermentation of the paste when kept. These may be avoided by employing the following formula, viz: Triturate to liquefaction six parts of phosphorus and one part of pure sulphur, with six parts of cold water, that is, added in portions; afterwards mix in two parts of flour of mustard, ten parts of cold water, eight parts of of sugar, and twelve parts of rye flour. Stir it to the consistence of a soft paste, and keep it in pots closely stopped.—*Neues Jahrb. für Pharm. and Repert. de Pharm.*

Florida Indigo.—Indigo was formerly cultivated in Florida, for which the climate and soil is well adapted. It grows wild upon the barrens in almost every portion of the Peninsula. When cultivated by the English in this country, the Indigo of Florida was considered in the London market superior to all others, except that of Caraccas. The manner of cultivation and manufacturing advantageously is as follows:

The seed, which is very small, is soaked for some twelve hours, then mixed with ashes or sand, and sown in drill rows, about eighteen inches apart. The time for sowing in Florida is from the middle of March to the first of April. When the young plant makes its appearance, it resembles white clover, and must be carefully weeded, and the earth kept loosed about its roots. Three weedings are sufficient to carry it up to the first cutting, which commences when the plant begins to bloom, say about the first of July. The plant is so easily injured by the sun after it is plucked, that the cuttings should be in the afternoon. As fast as it is cut, which is done by a sickle, it is carried to a vat called the steeper. This vat is made of plank, is water-tight, and varies in size according to the extent of the operations of the planter. The steeper is filled with cuttings immersed in water. Planks, with weights upon them, are then placed on top to keep the cuttings beneath the water. In this state steeping is continued for about ten hours, or less, according to the temperature of the water. When the water assumes an olive color, it is drawn into the "beater," another

vat, placed alongside and beneath the steeper, and connected by a tube, and fastened with a valve or spigot. The liquid is now churned by hand or with machinery, until it becomes lighter in color, and a blue fecula begins to make its appearance. From time to time lime water is thrown into the beater during the "churning." After the fecula spoken of distinctly appears, the water is suffered to remain about four hours for the Indigo to settle. It is then drawn off, the sediment placed in bags, and hung up to drain. When drained sufficiently, it is placed in boxes to dry, under gentle pressure; and when dried firm, it is cut up into square cakes and placed in the shade, to become completely dried by evaporation. The shorter the steeping and the less the beating, the lighter will be the color of the Indigo. The Indigo plant will yield two or three cuttings a season, and one hand will cultivate about three acres, the result being from 175 to 200 lbs. of the article. Unlike sugar cane or corn, the Indigo requires no expensive machinery. Where it is made only for domestic use, barrels are used for steeping and beating.—*Florida News*.

On Lemon Juice. By DR. BENGE JONES.—Experiments on fresh lemon juice, by Mr. Whytt, of the College of Chemistry, furnished the following results. It had specific gravity 1036.0, 1037.9, and 1038.4; and in two specimens each ounce of juice contained about 28.1 to 27.5 grains of pure anhydrous citric acid, and when burnt yielded only 1.74 grains of ash = 3.60 grains of ash in 1000 grains of juice. The ash contained—

	In 1000 parts.	In 1 oz. of lemon juice.
Potash	443.4	= .767
Soda	21.6	= .038
Lime	76.1	= .131
Magnesia	33.4	= .058
Sulphuric acid	124.7	= .215
Chlorine	12.3	= .022
Carbonic acid	196.6	= .339
Phosphoric acid	75.6	= .130
Phosphate of iron,	10.6	= .018
Silica	5.7	= .010

1000.0

1.724

London Med. Times and Gaz.

On two New Tæniifuge Medicines imported from Abyssinia—the Saoria and the Tatzé.—The *Saoria (sauarja)* is the ripe and dried fruit of the *mæssa (bacobotrys) pida* (Hachsetter). According to M. Schimper, it is found throughout Abyssinia, at the height of 7000 to 9000 feet, never below 6000 feet. The fruit is an ovoid drupe, covered over two-thirds of its apex by the calyx, and of a greenish yellow color. The seeds are turbinate, angular, flattened at the apex, and covered by a resinous substance in ellipsoid

grains. The long diameter of the fruit is from three to four millimetres, the short diameter a little less ; it is then about the size of pepper. The taste is at first somewhat aromatic, oily and astringent, and leaves for some time afterwards a tolerably persistent acid sensation in the pharynx. M. Schimper states that the dried fruit is administered in powder, in doses of 32 to 44 grammes ; that it purges, and kills and expels the worm entire, without affecting the health of the patient.

The *tatzé* is the fruit of the *Myrsina Africana*, a native of Abyssinia, the Cape of Good Hope, the Azores, and Algeria. It is a more disagreeable remedy than the saoria ; and in six cases in which it was administered, the patients did not complain of any colicky symptoms being induced, and its purgative operation is not constant. It imparts an inky tinge to the urine. It is said to be tænicide. It succeeded in expelling the tænia in each of the six cases in which it was given, and in one of these, several other active vermifuges had failed. The medium dose of the powder of *tatzé* is fifteen grammes, followed, if necessary, by a dose of castor oil.—*Brit. and Foreign Med. Chur. Review*, from *Bull. Gén. Thérap.*, July, 1854.

Description of a New Gas Furnace. By PETER HART, Manchester.—The apparatus I am about to describe was devised by me to answer the purpose of a Russian spirit furnace, at the same time employing gas as fuel. Its leading feature, and the one in which I think it differs from most other gas furnaces consists in the substitution of a jet of steam for one of compressed air. With this apparatus I can get a platinum crucible to a white-red heat in a few seconds, which is more than sufficient for all ordinary ignitions, fusions, and other analytical operations. When once set to work and properly regulated, it may be left to itself for a considerable time, thus sparing the operator the annoyance of standing by and working the blowing apparatus for half an hour: no bellows, or other such instrument is required to work it; and lastly, it is so simple and inexpensive that any tin-worker would, I think, be able to make one in at least a couple of hours.

My apparatus consists of a copper basin, about five inches in diameter ; the edges are soldered down to a circular copper plate, in the centre of which a small hole is drilled ; into this (to serve for a jet) is soldered one of the small copper tubes cut from a Leslie's patent gas burner ; this jet is inserted into what in gas-fitters' parlance is termed an elbow-joint, standing exactly in the centre of the upright tube ; this elbow-joint has screwed into it a short piece of ordinary gas-tubing ; when this, together with a short tube for the purpose of admitting water, is soldered on, the apparatus is complete. To set it to work, fill the vessel half full of water, and set it in the ring of a retort-stand over a gas flame, having first inserted a good cork into the short tube ; then connect by means of a length of india-rubber tubing with a supply of coal-gas ; when the water boils, turn on the gas,

and light it; the steam rushing through the jet will produce with the flame an extremely hot brush of blue flame, exactly like the flame of a spirit furnace; if the pressure is allowed to get too high, the flame will be blown out; of course the steam is regulated by increasing or diminishing the flame under the apparatus. A very few trials will enable the operator to discover the proportion of steam and gas which gives the most intense heat. Each time before using, the jet should have a pin inserted into it, to see that it is not choked up, as when that happens to be the case, a very few moments suffice to get the steam sufficiently high to violently eject the cork, together with the whole of the water contained in the apparatus. In working with this as with a spirit furnace, it is advisable to stand on the other side to that towards which the cork is likely to be driven.

Chem. Gaz., May 1, 1855.

NOTICE.

TO THE PHARMACEUTISTS AND DRUGGISTS OF THE UNITED STATES.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The 3rd Section, First Article, of the Constitution requires the President, at least three months previous to the annual meeting, to publish a call, in all the Pharmaceutical, and in such other Medical Journals as he may select, stating therein the objects of the Association and the conditions of the Membership. In compliance with this duty, you are hereby notified, that the next annual meeting of the Association will be held in the City of New York, on the second Tuesday (11th) of September, 1855, at 3 o'clock, P.M.*

The objects of the Association are, to deliberate on the condition of our profession, the advancement of Pharmaceutical knowledge, and the elevation of the professional character of Apothecaries and Druggists throughout the United States.

CONDITION OF MEMBERSHIP.

Section II.—ARTICLE I. All pharmacutists and druggists who shall have attained the age of twenty one years, whose character, morally and professionally, is fair, and who, after duly considering the obligations of the Constitution and Code of Ethics of this Association, are willing to subscribe to them, shall be eligible for membership.

ARTICLE II. The members shall consist of delegates from regularly constituted Colleges of Pharmacy and Pharmaceutical Societies, who shall present properly authorized credentials, and of other reputable Pharmaceu-

[*Mr. John Meakim, one of the Vice-Presidents of the Association, informs us that the meeting will be held at the rooms of the College of Pharmacy, in the HALL OF THE NEW YORK MEDICAL COLLEGE, on Thirteenth street, between Third and Fourth Avenues.—EDITOR.]

tists feeling an interest in the objects of the Association, who may not be so delegated, the latter being required to present a certificate signed by a majority of the delegates from the places whence they come. If no such delegates are present at the Association, they may, on obtaining the certificates of any three members of the Association, be admitted, provided they be introduced by the Committee on Credentials.

ARTICLE IV. Every member shall pay into the hands of the Treasurer the sum of two dollars as his yearly contribution.

ARTICLE V. Every local Pharmaceutical Association shall be entitled to five delegates.

W. B. CHAPMAN, President.

Cincinnati, April 11, 1855.

Editorial Department.

THE FLUID EXTRACTS OF TILDEN & Co.—In our last number we acknowledged the reception of twenty-one specimens of Tilden & Co.'s fluid extracts, then too late for notice. Since that time, two months, they have been kept in a closet at the temperature of the store with the mercury varying from 70° to 94°, with no means taken to prevent its influence. These preparations are said to be made according to the Pharmacopœia, when official, and in several instances according to formulæ published in this journal when not recognized by authority, whilst some are made by the judgment of the manufacturers, always, in such cases, being of the strength of 1 oz. to fʒi. They are put up in panelled bottles, holding about four fluid ounces labelled and wrapped.

Belladonna, Hyoscyamus and Lobelia. These fluid extracts may be noticed together. They are, when shaken, dark green fluids, owing to the chlorophyll they contain, the two first appearing evidently to be made from the recent plant. The Belladonna and Hyoscyamus smell strongly of the recent plants when bruised, and have their peculiar taste well developed. Although made from the green plants, the proportion is a fluid ounce to an ounce of the dried plant, which is ascertained by drying a small quantity of the herb and ascertaining its loss, and then using a corresponding quantity of the recent plants. Being concentrated in vacuo and preserved with a little alcohol, these fluid extracts appear to be fully charged with the sensible and medicinal properties of these drugs.

Rhubarb, Senna, Rhubarb and Senna, Senna and Taraxacum, Senna and Spigelia, and Buckthorn.—These appear to be well made. The Rhubarb, while it has the proper odor and taste, is rather more fluid than it usually appears. So much depends on the choice of the root that it is a difficult matter, obscured as the taste is with aromatics, to judge with cer-

tainty. The Senna is excellent, and is 'all the better for being made in vacuo—as are the compound extracts containing it, *Spigelia*, *Taraxacum*, and *Rhubarb*. They are all preserved with sugar and have a syrupy consistence. The fluid extract of Buckthorn is made from the nearly ripe berries, and presents the form of a dense reddish-brown syrup, from which a portion of the sugar has crystallized, owing, probably, to the alcohol added to keep it. Its activity is such that a tea-spoonful is given as a dose.

Serpentaria, *Chamomile*, and *Gentian*.—There are two formulæ for fluid extract of *Serpentaria*—that of Alfred B. Taylor, made with diluted alcohol, of the strength $\text{f}\bar{\text{z}}$ i to $\text{f}\bar{\text{z}}$ i, and that of John C. Savory, preserved with sugar, and of the strength $\text{f}\bar{\text{z}}$ ss to $\text{f}\bar{\text{z}}$ i. The latter appears to be that followed by Mr. Tilden. The fluid extract, however, does not possess the decided bitterness and camphorous pungency that it should, nor is its aroma as well marked as it should be. The *Chamomile* represents only the bitter extractive, as none of the aroma of the flowers is perceptible. Although difficult to retain, when water is the menstruum, a preliminary tincture with alcohol, to be evaporated afterwards spontaneously and added to the concentrated infusion, would ensure the presence of the volatile portion to a considerable extent. The *Gentian* is well prepared.

Cimicifuga, *Scutellaria*, *Buchu*, and *Uva Ursi* well represent the respective drugs. The *Scutellaria* has recently been tried by Dr. Bates with marked success in nervous diseases. The aroma of the *Buchu* speaks for itself.

Sarsaparilla, *Compound Sarsaparilla*, *Stillingia*, *Rumicis Crispus*, and *Taraxacum*. The fluid extract of *Sarsaparilla* is not the official preparation, nor is the compound extract made by that recipe, but contains conium—the simple extract is probably made from American *Sarsaparilla* (*Aralia nudicaulis*), as neither its odor or taste are those of the *Smilax*. The *Stillingia* and *Yellow Dock* are indigenous medicines, gaining favor with the profession; in this form they will be found very convenient. Lastly, the *Taraxacum* was examined and found to be a saccharine liquid having the odor and taste of the root, but not manifest to the same degree as in the spirituous fluid extract, or the prepared juice.

Having thus hurriedly passed the several preparations of the *Materia Medica*. Tilden in review, it seems right in the connection to make a few remarks on this new branch of the enterprise of these gentlemen. With their gardens and apparatus described before (see vol. xxiii., page 386) they have great advantages for the preparation of the fluid extracts of indigenous plants; and for the same reason, with choice drugs, they may equally well prepare fluid extracts from them. There are some cases, however, where the apothecary should always prepare them himself, because so much depends on their uniformity that he is not justified in relying upon a commercial article of which he cannot be assured of the age and condition. On the other hand, there are many which these gentlemen may produce

with great advantage, especially to country practitioners, who often need concentrated medicines in their rural pharmacy. Necessarily more prone to decomposition than solid extracts, it is an important point to render them as permanent as possible, and to this end the propriety of an alcoholic menstruum is sometimes undoubted, even where its solvent power is not called into play.

AMERICAN PHARMACEUTICAL ASSOCIATION.—The period is rapidly approaching when the Association will hold its Annual Meeting for 1855, in New York. We have stated in a note to the announcement of the meeting on a preceding page, that the rooms of the New York College of Pharmacy, in the Hall of the New York Medical College on Thirteenth Street between Third and Fourth Avenues, have been fixed upon by the Committee of Arrangement of that Institution. This locality, though comparatively central on the city plot, is considerably north of the business centre, which may now be placed at the Park or City Hall. For the information of those who are not familiar with New York localities, it may be useful to state that the Third and Fourth Avenue cars leave the south end of the Park on the Chatham Street side, at short intervals, and cross Thirteenth Street within a square of the place of meeting. This will enable members stopping at hotels in the business district to go and return with the least inconvenience. Omnibuses are also constantly passing along Broadway within a short distance of the Hall.

As the modification of the Constitution will probably be an important feature in the discussions, members proposing to be in attendance would do well to give some consideration to that document as it at present stands. Another point of general interest is the Report on a certificate of membership. Besides the Reports of Committees, it is probable that many subjects of local and general interest will be brought forward, and among these we hope to find those of a scientific character, practical and theoretical, of which not a few deeply interest our profession.

It is probable that many pharmacutists may be attracted to the meeting at New York, in part, by the opportunity it will afford them of making important business transactions in that great commercial metropolis; and we hope our New York friends will suggest to those who may be there without reference to the meeting, that they attend its sittings.

SULPHATE OF QUINIA.—Our readers will perceive that Dr. Squibb has again given his experimental attention to the Sulphate of Quinia of Messrs. Powers & Weightman. The position he now takes is somewhat different from that in his first communication, in July; whilst the manufacturers, after a fuller investigation than they had previously had time to give the matter, corroborate their previous statements and question the results of Dr. Squibb. The chief point at issue is, does disulphate of quinia, when dried at a temperature of 240° F. till it ceases to lose weight, retain two equiva-

lents of its water of crystallization? Dr. Squibb's averments are based on the assumption that it does. Mr. Weightman's results convince him that it does not. Again; Dr. Squibb, in asserting that other impurities exist, does not appear to have duly considered the alterations incident to the action of heat and air on the alkaloid base of the salt, during the desiccating and evaporating processes to which it was subjected in his experiments— influences well known to act on almost all forms of organic matter, as suggested by Mr. Weightman. When the subject was first brought forward by Dr. Squibb, we looked upon it in the light of a new fact, previously overlooked, that this salt might crystallize with more than the eight equivalents of water, as usually stated by chemical writers, and that it should be known, else we should have recommended that justice to the uniformly good quality of their chemicals should have claimed for the manufacturers a private hearing, at least until the reality of their shortcoming should have been unequivocally demonstrated by a series of parallel examinations made with the commercial sulphate of quinia of other manufacturers, foreign and domestic. Until this is done by Dr. Squibb or a disinterested third party, we claim the privilege of arresting a judgment which, however well intentioned by Dr. Squibb, is calculated to injure the deservedly excellent reputation of the manufacturers.

NEW YORK COLLEGE OF PHARMACY. PRESCRIPTIONS.—The New York College of Pharmacy, in July last, issued a circular letter to the physicians of that city in reference to the want of uniformity in the language and construction of prescriptions as a fruitful source of errors in compounding them. Looseness in this important office of the physician has perceptibly diminished in this city since the joint action of the County Medical Society and the College of Pharmacy, yet there is room for much improvement at the present time, not only in the mechanical execution but in attention to the official nomenclature. Habit is as powerful an auxiliary in well-doing as in ill-doing, and much would eventually be gained if medical preceptors and teachers would insist on the importance of correct and neat prescriptions in their instruction to their students.

PHILADELPHIA COLLEGE OF PHARMACY.—The School of Pharmacy in this Institution will be opened by a general introductory, on the second of October. A programme of the courses will be found in our advertising columns, together with an extract from the By-laws in reference to the qualifications required of candidates for graduation.

THE
AMERICAN JOURNAL OF PHARMACY.

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NOVEMBER, 1855.  
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PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION AT ITS MEETING HELD IN NEW YORK, SEPTEMBER 11, 1855.

THE AMERICAN PHARMACEUTICAL ASSOCIATION convened at the Hall of the New York Medical College, City of New York, September 11th, 1855, at 3 o'clock, P. M.

The President, William B. Chapman of Cincinnati, not having arrived, the meeting was organized by Vice President H. T. Cummings of Portland Me., and Secretary E. S. Wayne, of Cincinnati.

On motion a committee of three were appointed by the Chair to examine credentials, which duty was assigned to Messrs. C. B. Guthrie, Charles Ellis, and W. J. M. Gordon.

The Committee retired, and after a recess reported the following list of delegates accredited to this meeting.

From the Massachusetts College of Pharmacy—S. M. Colcord, Henry W. Lincoln, Ashel Boyden, Henry D. Fowle and Daniel Henchman.

From the Philadelphia College of Pharmacy—William Procter, Jr., Charles Ellis, Edward Parrish, S. S. Garrigues, and Henry C. Blair.

From the New York College of Pharmacy—John Meakim, J. S. Aspinwall, George D. Coggeshall, Benjamin Canavan and W. F. Lindsey.

From the Cincinnati College of Pharmacy—William B. Chapman, Edward S. Wayne, W. J. M. Gordon, A. M. Stevens, and J. C. Parr.

From the Maryland College of Pharmacy—A. P. Sharp.

From the Memphis Pharmaceutical Association—Prof. C. B. Guthrie, S. Mansfield, and Henry Wade.

The following gentlemen having been severally recommended by members of the Association, and endorsed by the Committee as eligible for membership, were elected, viz., F. A. Hegeman, of New York City, A. J. Matthews, of Buffalo, N. Y. and Frederick Stearns, of Detroit, Mich.

The roll was then called by the Secretary. The following members, not before mentioned, answered to their names, viz. Henry F. Fish, of Waterbury, Connecticut; Eugene Dupuy, New York City; and S. P. Peck, of Bennington, Vermont.

On motion the following gentlemen were appointed a committee to nominate officers for the Association, viz., Messrs. Canavan, (N. Y.,) Procter, (Philada.,) Lincoln, (Boston,) Wayne, (Cinn.,) Guthrie, (Memphis,) by the Delegations, and Messrs. Dupuy and Henschman by the Chair. Which committee retired.

The report of the Treasurer being introduced was read, and referred to Messrs. Henry F. Fish and Edward Parrish to be audited.

The report of the Executive Committee was read and laid on the table.

The report of the Committee on the Sale of Poisons, etc., was read, and its consideration postponed.

The Committee appointed to nominate officers reported the following names:

For President—JOHN MEAKIM, of New York.

For Vice Presidents, { Prof. C. B. Guthrie, of Memphis.
Charles Ellis, of Philada.
Henry F. Fish, of Connecticut.

For Treasurer—James S. Aspinwall, of New York.

For Recording Secretary—W. J. M. Gordon, of Cincinnati.

For Corresponding Secretary—William Procter, Jr., of Phila.

For the Executive Committee—George D. Coggeshall, of New York; A. J. Matthews, of Buffalo; S. M. Colcord, of Boston.

The report of the Committee was accepted, and on separate ballots the nominees were elected to the several offices for the ensuing year.

The President elect was conducted to the Chair, and in a per-

tinent speech returned his thanks for the honor conferred upon him, and promised his best exertions for the promotion of the interests of the Association after which, on motion, the thanks of the Association were tendered to the temporary chairman, for his able services in the organization of the meeting.

The names of John Milhau and Oliver Hull of New York City, being brought forward by the Credential Committee, they were duly elected members of the Association.

Prof. Guthrie, Chairman of the Committee on the Statistics of Pharmacy, reported the inability of the committee to make any further report than they had formerly done. On motion of Mr. Parrish, this committee was discharged and the duties that devolved upon it were referred to the Corresponding Secretary, for the ensuing year.

Mr. Ellis, on behalf of the committee on the certificate of membership, appointed in 1853, read a report, from which the following is an extract :

"The committee is impressed with the belief that it is expedient to have a neatly engraved certificate of membership—chaste and appropriate in its design—and in the wording of it adapted to the purposes in view. After careful inquiry as to the cost, and an examination of finely executed engravings upon stone, the committee would recommend a lithograph engraving, having ascertained that such an one of suitable size can be executed, the whole expense not to exceed one hundred and twenty to thirty dollars, including the paper and printing of a sufficient number of impressions. For the purpose of conveying to the members of the Association an idea of the size and character of the engraving, the committee will submit one of a similar character and purpose from the Pharmaceutical Society of Great Britain.

"The committee recommend that the price of the certificate be fixed at three dollars each, and that all the members present be invited to subscribe for a copy, so that the necessary funds may be raised before the adjournment of the Association."

After the reading of this report, Mr. S. M. Colcord requested to read the following remarks relative to the late Chairman of the Committee, Andrew Geyer, of Boston, which was granted.

"MR. PRESIDENT:—It is with deep regret that I have to announce to the Association the decease of one of its members, since our last meeting. Andrew Geyer, for thirty years or more engaged in the apothecary business in Boston, now sleeps with the silent dead. He was one of us in a far

greater sense than mere membership would imply. Our objects were with him matters of every day thought and study; he was a student in pharmacy and medicine to the last of his business career, and one of the most thoroughly read apothecaries in our city; his small library contained the most recent works and bore evidence of attentive perusal; his leisure moments were spent in reading and attention to theoretical pharmacy; he understood the value of a thorough pharmaceutical education, and it was often the subject of conversation between us. In one of my latest interviews, with him he informed me that it was his purpose to send his two clerks to Philadelphia to attend the lectures of that college, and take advantage of the better facilities for a thorough pharmaceutical education offered in that city, with a view to making them adepts in the profession.

As a business man Mr. Geyer was honest in his dealings, energetic and attentive to business, gentlemanly in his deportment, agreeable in conversation, candid in the expression of his views and feelings, and warm in his friendship. His attachment to the objects of our Association, and the warm interest he was pleased to manifest towards us, will long remind us that in his death we have lost the counsel and valuable services of an efficient member, and Pharmacy a sincere friend to its progress and professional advancement."

On motion of Mr. Colcord the following resolution was unanimously adopted, and his remarks preceding were also directed to be placed among the minutes.

Resolved, That this Association has learned with deep regret the death of our esteemed associate, Andrew Geyer, of Boston. His amiable qualities, professional ability, and the warm interest he manifested in our Association, lead us to deplore his death, as of one devoted to the best interests of pharmacy, and a loss to our Association; one for whom we entertained feelings of friendship, and to whose memory we pay this spontaneous tribute of respect.

The consideration of the report on the Certificate of Membership was postponed, and the meeting adjourned to meet on Wednesday morning at 10 o'clock.

September 12th—Morning Session.

The Association was called to order by the President, John Meakim.

The minutes of the last meeting were read, corrected and adopted.

The following gentlemen, being recommended and endorsed

by the Committee on Credentials, were duly elected members, viz. J. P. Dodge, John Canavan, and James T. Maxwell of New York, and William Thomas of Jersey City, New Jersey.

The report of the Committee on Certificate of Membership being in order, the report of Mr. Geyer, of last year, was read, and after again reading the report of Mr. Ellis, the latter was adopted, and the committee were continued.

It was moved by Mr. Parrish that William Procter, Jr. and John Meakim be added to the committee, which committee shall be empowered to decide upon the design, to issue the certificate, and to deliver it to all subscribers and members who may pay for it; which was carried.

It was moved and carried, that the Treasurer pay to the widow of the late Andrew Geyer, fifty dollars, for expenses incurred in getting up a design for certificate of membership.

[Considerable discussion ensued on the reading of the report. The Committee exhibited certificates of the London Pharmaceutical Society, of the Boston College, of the New York College, and the draft of Mr. Geyer, presented at Cincinnati last year. Of these, that of the London Society approached nearest to the idea entertained by the members. It consists of an Arabian, figurative of Avicenna, and an European, figurative of Galen, resting on the opposite sides of a shield, surmounted by a mortar and pestle, symbolic of our profession, whilst twined around the mortar and falling to the foreground is a loose festoon composed of the most important medicinal plants, the whole arranged on a substructure exhibiting three apartments, the middle occupied by an alchemist at his crucible, and others by apparatus symbolical of chemistry and pharmacy. It was suggested by the Committee that this design should be modified by adding the figure of an American Indian presenting the rich gifts of his *materia medica* to those of the old world, with other symbols appropriate to our position in the Pharmaceutic brotherhood. Objections were made to the adoption of any part of the English certificate, desiring a picture suggestive only of American ideas, but the Committee very properly pointed to the universality of Pharmaceutic Science, and the indebtedness of American Pharmacutists to their brethren of the old world. The design of Mr. Geyer embraced figures of Apollo, Mercury, and other classical symbols, whilst the general mass of the picture exhibited a modern apothecary-shop with many of its details, to which was added a shield of the United States giving nationality to the whole. This design not being approved of, and it not being probable that all could agree, it was thought best to entrust the whole matter to the Committee, as above stated.—EDITOR.]

The Committee appointed to report on standards of quality

for those drugs capable of them, with appropriate tests for detecting adulterations, offered a report, which was accepted and the Committee continued.

[This report embraces the following paragraph: "They furthermore have felt discouraged from prosecuting the work by the disregard that is paid to proper qualification in the appointment of officers to carry out the requirements of the drug law. So glaring has this disregard on the part of the Secretary of the Treasury become, that designing druggists at one port, where a strict scrutiny is administered, have their importations of a doubtful nature sent to another port, where a less scrupulous examiner officiates, so that they may be passed. This the Committee *know* to be true, and whilst it continues, no system of accurate standards of quality will benefit the drug market and screen out the adulterated and deteriorated articles. The Committee would earnestly suggest to the Association that some decided step should be taken to remedy this evil, by placing some check on the appointing power, so that it shall not be able to displace qualified officers by incompetent persons, at every phase of the political kaleidoscope. If this Association, the several Colleges of Pharmacy and the National Medical Association, would join in a united effort, some impression might be made on Congress with a view to remedying the evil."]

Alfred B. Taylor, Chairman of the Committee appointed "to draft a law regulating the sale of poisons," presented a report, which was accepted and the Committee discharged.

[This Committee did not succeed in drafting a law, from their inability to get at the information relative to existing legal enactments. The report says, "The want, therefore, of all reliable information upon the subject under consideration prevents your Committee from forming any matured or intelligent judgment, or from offering any suggestions as to the expediency of any particular legislative prohibitions, in view of the general welfare. It is doubted, however, whether poisoning is of less frequent occurrence in France, where it is well known very stringent restrictions are established, than in an equal population here, where no such restraints exist. If this be the case, it would certainly form an argument against the establishment of any such 'protective policy' in our own country: every barrier to absolute freedom of trade being confessedly an evil, justifiable or tolerable only by the avoidance thereby of other evils of greater magnitude. The popular jealousy of such restraints, and the improbability or rather the impossibility of inducing any considerable number of States to adopt a common system of Legislation in this matter, would also form an objection to any governmental interference."]

The Committee appointed to inquire whether any and what amendments were required by the law regulating the importation

of Drugs and Medicines to render it more efficient, uniform and advantageous to the public at large, made a long and able report through the Chairman, Prof. Guthrie, which was read, and on motion postponed for action at a future sitting.

Moved and carried that when we adjourn, we meet at 3½ o'clock, P. M.

W. B. Chapman, of Cincinnati, announced the death of our late associate, L. Rehfus, with a few remarks on his long and honorable position in the Pharmaceutical profession at Cincinnati, which he had recently resigned to give his attention to the culture of the grape and the manufacture of wine, concluding by offering the following resolution, which was unanimously adopted.

Resolved That the Association has learned with deep regret the removal by death of our late worthy brother, L. Rehfus; and that a record of this resolution be placed on our minutes.

The Committee on the adaptation of wines of American growth for medicinal purposes, and the probable amount of tartar to be produced, were unable to report, in consequence of the death of Mr. Rehfus, Chairman, but Prof. Guthrie, one of the Committee, stated to the meeting that Mr. Edward S. Wayne had prepared an essay on that subject, which he was invited to read at the opening of the afternoon session.

Then adjourned.

Afternoon Session.

The meeting having been organized by the President, the minutes were read and adopted.

Mr. Wayne then read a minute and able report on the growth and production of wines, tartar, &c., in the west; whereupon Mr. Lincoln offered the following resolution which was unanimously carried.

Resolved, That a vote of thanks be tendered to Mr. Wayne for the very able and interesting report offered by him upon the wine culture, and that it be embodied in the published proceedings.

[Our readers will find an abridgment of this report at page 494.—EDITOR.]

The report of the Committee on Revising the Constitution, together with a draft of the Constitution as revised, was read, and after considerable discussion, was laid over till the next meeting.

Mr. Colcord gave notice that he would present to-morrow, Art. 2d of the proposed Constitution, omitting the clause on *honorary* members, as amendments to the Constitution.

Mr. Parrish gave notice that he would to-morrow bring forward an amendment of the Constitution, in reference to honorary membership.

The report of the Committee on the drug law was called up and laid over until to-morrow.

Then adjourned to meet at 10 o'clock on Thursday morning.

September 13th—Morning Session.

The President having taken the chair, the minutes were read, corrected and adopted.

On motion of Mr. Parrish, it was carried that the Association commence at 12 o'clock an examination of the specimens on the table, and the reading of scientific papers.

Moved by Mr. Colcord and agreed to, that a Committee be appointed to receive any specimens or papers that may be presented to the Association for examination, or otherwise, and report, which duty the Chairman assigned to Messrs. Procter, Coggeshall, and Lincoln.

Moved by Mr. Colcord, and carried that the Constitution be revised by striking out Article 2d, Section 1st and 2d, and adding as follows.

"ARTICLE 2.—OF THE MEMBERS.

Sect. 1st. Every apothecary and druggist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, who after duly considering the object of this Association and the obligations of its Constitution is willing to subscribe to them, is eligible to membership.

Sect. 2d. The mode of admission to membership shall be as follows: Any person eligible to membership, may apply to any member of the Executive Committee, who shall report his application to the said Committee, and if after investigating his claims they shall approve his election, they shall at the earliest time practicable report his name to the Association and he may be elected by two thirds of the members present on ballot. Should an application occur in the recess, the members of the Committee may give their approval in writing, which, if unanimous and endorsed by the President, shall constitute him a member, and the fact be reported to the Association at the next succeeding meeting.

Moved by Mr. Parrish and adopted that the following section be added to article 2d of the Constitution, viz :

ARTICLE 2.

Sect. (3d.) Pharmacutists, chemists, and other scientific men who may be thought worthy of the distinction, may be elected *Honorary* members, upon the same conditions and under the same rules that appertain to active members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office nor to vote at the meetings.

Moved by Mr. Colcord and passed that the following section be added to article 2d, viz :

Sect. 4th. Members shall be entitled on the payment of five dollars to receive a certificate of membership signed by the President, one Vice President, and the Secretary, covenanting in writing to return the same to the proper officers on relinquishing their official connection with the Association.

Also moved by Mr. Parrish and carried, that all existing members of the Association be entitled to receive the certificate of membership at the price of subscription reported by the Committee.

The report of the Constitution Committee being called up, on motion it was referred to a new Committee to report next year. The Chair appointed Edward Parrish, S. M. Colcord, and James S. Aspinwall.

The Committee on Home Adulterations reported verbally, through their Chairman, Prof. Guthrie, but this form of report being objected to, it was moved by Mr. Colcord and carried, that the Committee be instructed to report in writing to the Executive Committee, which report, if approved by the President, shall be published with the proceedings; the Committee was continued.

[We have not, as yet, been able to get this report from the Chairman of the Committee; it contained some interesting facts.—EDITOR.]

On motion of Mr. Colcord, it was

Resolved, That the mere publication of reports and other papers, especially reports of Committees not unanimous, shall not be considered as an expression of the views of the Association.

The hour for hearing scientific papers, and for examining specimens, having arrived, Mr. A. P. Sharp, of Baltimore, offered a paper, which he read, on the strength of alcohol and acids, and he was requested to furnish an abstract for publication in the Proceedings.

[The following are the leading points in the remarks of Mr. Sharp. He finds but little regard is paid to the official strength of acids and alcohol by the manufacturers, and infers the absolute impossibility that it presents to carrying out to the letter the processes of the Pharmacopœia, where they are used. He has not been able to find pure muriatic acid of greater strength than 1.120 to 1.130, whilst the Pharmacopœia requires it to be 1.160. Common nitric acid he finds not to exceed 1.40, and the "medicinal acid" often not stronger than 1.34, and the strongest he has ever obtained is 1.370, whilst the official strength is 1.42, and several of the processes are based on the use of an acid of that strength. He attributes the difficulty in preparing the tincture of chloride of iron and the solution of nitrate of iron to this cause—a deficiency of acid; and observes that either the Pharmacopœia should be altered, or that pharmacæutists should insist on their having their acids made of the proper official specific gravity.]

Mr. Sharp then directed attention to alcohol. The Pharmacopœia requires it to have the specific gravity .835 or 85 per cent of absolute alcohol by weight. He knows of but two kinds in commerce, 80 and 95 per cent; the latter a mere name only. The strength of alcohol appears to depend on the locality of its manufacture. Ninety-eight per cent in Cincinnati, is ninety-five per cent in New York, and eighty-eight to eighty-nine in Baltimore, which is owing to the instruments used at these places varying in the principle of their graduation. These instruments are intended for testing spirits from 1st to 4th proof, and attention has not been given to the great variation of the expansion of alcohol as the strength increases. Mr. Sharp illustrated the latter fact by an occurrence in Baltimore, where alcohol warranted to be 95 per cent proved to be but 89 per cent, when tested by the specific gravity bottle and a delicate balance; the party who held it not being convinced until he found that his instrument sunk in some alcohol of really 96 per cent, beyond the 100th degree.

Alcoholmeters also differ from the fact that some are intended to indicate the per centage of alcohol by weight, and the others by measure, which of course makes a considerable difference in the scales. Mr. Sharp finds the hydrometers inclosing a thermometer as made by Lohme & Co. of Berlin, are very reliable instruments.—EDITOR.]

A. E. Richards, of Plaquemin, Louisiana, having been previously elected a correspondent, became a member by coming forward and signing the Constitution.

The report of the Committee to audit the Treasurer's account was then taken up and accepted.

The report of the Executive Committee was again called up, read and accepted, and was ordered to be published in the Proceedings.

[From this report we learn that 2000 copies of the Proceedings of the Cincinnati meeting, and 3000 copies of the address to Pharmacutists were circulated by the committee.]

The following gentlemen having previously been elected, were present during the session, signed the Constitution, and paid their contributions, viz :

A. I. Matthews, Buffalo, New York.
Frederick R. Stearns, Detroit, Michigan.
A. P. Sharp, Baltimore, Maryland.
S. S. Garrigues, Philadelphia, Pennsylvania.
William Thomas, Jersey City, New Jersey.
James S. Aspinwall, New York City.
Benjamin Canavan, " "
F. A. Hegeman, " "
John Canavan, " "
John P. Dodge, " "

Moved and carried, that the Treasurer pay the deficit due the Executive Committee for 1854.

The following gentlemen being recommended and endorsed by the Credential Committee were duly elected.

Isaac Coddington, New York.
Frederick Hall, "
David Scott, Worcester, Massachusetts.
John Buck, Chelsea, "
Robert R. Kent, Boston, "

The report of the committee to inquire whether any and what amendments are required to the law regulating the importation of drugs and medicines to render it more efficient, uniform and advantageous to the public at large, was taken up and on motion of Mr. Colcord was accepted and ordered to be published with the Proceedings.

The yeas and nays being called for on the preceding vote, by Mr. Thomas, resulted in their being but two dissenting voices.

The following resolution offered by Professor Guthrie was adopted unanimously by those indicated.

Resolved, That those members of the Association who are strangers in New York, express their warmest gratitude for the kindness and attention they have received from the New York College of Pharmacy.

The following resolution, offered by Mr. Parrish was adopted. Whereas, the members of this Association, who meet annually to transact its business and forward its objects, have generally no leisure for pursuits not immediately connected therewith :

Resolved, That as a body we decline in advance any convivial or other entertainments, and esteem it important as our members increase to prevent the practice of the last three years, in this respect, from being a precedent in the future.

Moved by Mr. Dodge and adopted, that a committee of three be appointed to report what are the best text-books published, for use and reference, to the next annual meeting. This duty was referred to Messrs. Procter, Sharp and Ellis.

Mr. Colcord having tendered his resignation as a member of the Executive Committee, with satisfactory reasons, on motion, it was accepted and a new election proceeded to by ballot, which resulted in the choice of William Procter, Jr.

On motion of Mr. E. Parrish it was unanimously

Resolved, That the thanks of the Association are tendered to to the President and Secretary for the efficient and zealous performance of their duties.

On motion of H. T. Cummings it was

Resolved, That the duty of spreading a general invitation to druggists and apothecaries of the United States, and especially to those of Baltimore, Washington, and vicinity, and also timely notice to all the members, of the time and place of meeting, be specially referred to the Executive Committee.

Mr. A. P. Sharp, of Baltimore, offered the following resolution, which was passed.

Resolved, That when this Association adjourns, it adjourns to meet in Baltimore, on the second Tuesday of September, 1856.

The Committee on Specimens presented a report of the several articles deposited for examination, which was accepted, and the following resolution, brought forward by the Committee in reference to the depositors was passed.

Resolved, That the thanks of the Association, be and hereby are given to these gentlemen.

[From the report we learn that Messrs. Lubme & Co. of Berlin, through their agency at New York, exhibited a variety of instruments for chemical and pharmaceutical use, among which are several balances, lampstands,

lamps, sp. gravity and alkalimetry apparatus, gas burners, and a set of 36 specimens of alkaloids and other organic principles.

We had the pleasure of examining the article of Messrs. Luhme & Co. at their store 343 Broadway, where all the items of the laboratory for mineral and organic analysis may be had of the most approved patterns and qualities.

Mr. Weckberger exhibited a variety of ethereal products and fruit essences. Among the most interesting articles exhibited were specimens of the flower leaves, fruit and bark of two varieties of Cinchona from New Grenada, the *C. lancifolia* and the *C. cordifolia*, from Messrs. Powers & Weightman of Philadelphia. We also noticed a variety of green medicinal plants from the gardens of Tilden & Co., New Lebanon, N. Y., among which were Hyoscyamus, Belladonna, Valerian, Digitalis, etc., and specimens of American angols from Catawba wine, brought from Cincinnati by Mr. Wayne.—EDITOR.]

The following resolutions, offered by W. Procter, Jr., were passed, viz.

Resolved, Inasmuch as the offer of prizes by the Association last year has not been responded to, that this Association again offers the following prizes for the ensuing year, viz:

1st. *Resolved*, That a copy of twenty-three volumes of the American Journal of Pharmacy is offered for the best essay which shall develop the commercial history of all drugs indigenous to the United States, as senega, spigelia, serpentaria, etc., as regards the manner and places of their collection and preparation for the supply of commerce, the amount annually collected, and the channels through which they enter general commerce.

2d. *Resolved*, That the first six volumes of Gmelin's Chemistry be and hereby are offered for the best essay on any subject relating specially to Pharmacy.

To carry out the object of the resolutions in an efficient and impartial manner, it was

1st. *Resolved*, That all essays (in answer to the above resolution) be referred to a special Committee of judges, who will report on their relative merit to the next annual meeting of the Association. This committee to consist of Charles Ellis and W. Procter, Jr., of Philadelphia, and Dr. David Stewart, of Baltimore.

2d. *Resolved*, If, in the opinion of the Judges, none of the

essays received are worthy of the prizes, that they decline awarding them in their report. The contributors may then either withdraw their essays, or leave them in the possession of the Association.

8d. *Resolved*, That the essays contributed for the prizes be delivered, free of charge, to Charles Ellis, 56 Chestnut street, Philadelphia, on or before the second Tuesday of August, 1856, in order to give time for their examination.

There being no further business, on motion of Mr. Colcord, the Secretary proceeded to read the minutes of the several sessions, which being approved, the Association adjourned to meet in Baltimore, on Tuesday, the 9th of September, 1856.

Extracts from a Report on the Production of Wine, Brandy, and Tartar, in the vicinity of Cincinnati. By EDWARD S. WAYNE, of Cincinnati.

"The culture of the grape for the purpose of wine-making in the West is not so recent as is generally supposed. Amongst the earliest settlers of the Ohio valley, were a number of Swiss, French, and Germans, who were well acquainted with the culture of the grape, and being deprived in these wilds of their loved and accustomed beverage, soon saw in the hill-sides of their adopted home a resemblance to those of their native land, and their adaptation to the culture of the grape. It is to them that we are indebted for our vineyards. Their efforts soon attracted the attention of others, who finding the culture profitable, gave it impetus, and year after year the number of acres under cultivation has been rapidly on the increase.

"The earliest record we have of this culture in the West, is in 1796. Du-four mentions that he saw wine made by a Frenchman, at Marietta, in that year. Vineyards were started soon after at Galliopolis, and also at Vevay. They have all, however, fallen into decay. The earliest attempt made in the vicinity of Cincinnati, was by a French political exile, in 1799, whose vineyard was a hill-side, since graded, and now the heart of the city of Cincinnati. This was the beginning of that culture for which the environs of our city have at length become so distinguished.

"The failure of the early vineyards is to be attributed to the want of a suitable variety of the grape, adapted to the peculiarity of the soil and climate; foreign varieties have not been found to succeed well. Those which have been most successful, and produce good wines, are the Catawba and Isabella. The former is chiefly cultivated; the other varieties, of both foreign and native origin, are cultivated to a small extent. The Catawba is a native grape first noticed in North Carolina. The origin of the Isabella is obscure, but is, I believe, now generally admitted to be of foreign parentage. Each variety has, however, some peculiar advantage over the other, either in being more hardy, or the fruit less subject to disease. But although

the Catawba is more liable to the rot, the wine it produces is so much superior to all others that it may be said to be the only variety that is cultivated here with the view of wine-making. There are at present, within a short distance of Cincinnati, 1200 acres under cultivation, and of them, about 800 to 1000 acres are in a bearing condition. The average yield per acre is variously estimated. Particular spots, under favorable circumstances, have produced as high as 1000 to 1200 gallons of wine to the acre. A fair average will be about 400 gallons, which, allowing there to be 1000 acres in bearing, will produce 400,000 gallons of wine. This, at an average price of \$1.25 per gallon, amounts to half a million of dollars in value.

"The mode of culture pursued I shall not dwell upon, as I cannot find any two growers who entertain the same views in regard to it. There is much yet to learn on this subject. The methods adapted to foreign wine-culture have not been found to work well in practice here; they require considerable modification; time and experience will, however, overcome all such difficulties. The vines are usually grown from cuttings; these are planted in rows, and from four to six feet apart, and as the vine grows it is fastened to upright posts about eight feet high, and is kept closely trimmed to this height. Other plans are adopted, such as trailing them upon low lattice work, according to the caprice of the grower.

"The culture of the grape, like every other branch of agriculture, is attended with many vicissitudes. The *blight* (*Oidium Tuckeri*) and the *rot* are the most destructive, and which careful and unremitting toil and culture will not avert. The blight which for the last few years has almost destroyed the vintage of some parts of Europe, is no stranger to the vineyards of the West, and is a disease against which no remedy, as yet, has been discovered. It makes its appearance early in the season, about the time the young fruit is about the size of a pea. There are no premonitory symptoms of its attacks to be observed; everything about the vineyard may look prosperous, and the wine-grower, elated with the prospect of a good crop, may, upon waking in the morning, find that his rich anticipations of yesterday have, like his dreams, vanished; the greater part of his grapes covered with a white dust-like substance, the skins shrivelled, which soon blacken, and the grapes eventually fall to the ground. These attacks continue from time to time, until the vineyard is almost entirely stripped of its promise.

"The origin of this disease has been attributed to various causes; for instance, the want of inorganic constituents in the soil, and to the attacks of parasitic fungi. The appearance of this fungus growth upon the grapes is not the result of either of these suppositions. It is the result of a diseased action, or, in other words, it is the effect, not the cause of the disease, which is undoubtedly the result of atmospheric influences, and beyond human control. I have studied this disease for the last three years, and can form no other opinion in regard to its origin. In the early part of the season, about the time the young fruit is formed, the temperature during the day time is apt to be exceedingly warm, the heat causes a rapid evapora-

tion from the moist soil, and the atmosphere consequently becomes loaded with watery vapor. In the vegetation also the circulation and absorption is accelerated by the genial warmth, its vessels become filled with sap, and the flow of it is kept up by the rapid evaporation of its superfluous watery portion, through the medium of the leaves. Should the night be warm and clear these forces are kept up, but in a diminished degree, and the evaporation from the leaves still continuing the plant remains in a healthy condition; but should the night turn cold, a heavy fog is the result, the plant is surrounded by an atmosphere saturated with aqueous vapor, the evaporation from the surface of the leaves is checked, and a diseased action is the result. As there is a more complex chemical change taking place in the young fruit, it is the most likely to be injured or diseased by this check of forces, diseased action is the result, decomposition ensues, and the fungus growth follows as the result of that decomposition. That such is the origin of this disease, ample opportunities for observation have convinced me, and that the condition of weather stated will be followed invariably by the appearance of it. * * * * *

"Later in the season, about the time the young fruit is stoning, or in other words, the seed hardening, another disease called by wine-growers *the rot*, is apt to make its appearance, and finish the destruction only partially effected by the former. The grapes attacked by it exhibit a dark spot upon their surface, which gradually increases until the whole of the berry is of the same black color, and eventually falls to the ground. This disease is attributed to long continued wet weather at this particular period. The rot this season (1855) has been very destructive, and has destroyed about fifty per cent. of the crop."

[Mr. Wayne believes this supposition to be possible, and also thinks excessive pruning may have something to do with it.—EDITOR.]

"The vintage in the vicinity of Cincinnati commences about the middle of September. This is a busy period with the wine-grower, and requires much care and attention. To insure good wine the grapes must be fully ripe, (dead ripe,) if not the wine will be too acid, and deficient in alcohol, and flavor or bouquet. Every faulty berry must be picked from the bunches. The grapes are mashed in deep tubs, taking care not to crush the stones. The pulp is then thrown upon a coarse seive, and the stems of the grape separated from it.

"The press used is similar to a screw cider-press, and needs no further description."

"The quality of the wine, i. e. its flavor, strength, and acidity, depends in some degree upon the manner in which the grapes are pressed. Some makers press out all the juice at one operation, and consequently make but one quality of wine; others make three pressings from the same grapes, keeping the juice from each pressing separate. In the first operation very little force is used; the juice obtained is much richer in sugar than the sub-

sequent pressings. The wine it produces is consequently stronger in spirit, and is less acid, than the wine produced by pressing out all the juice at once or that from subsequent pressings. The must or juice is now placed in casks which are filled to within five or six inches of the bung, and loosely stopped up, and placed in a cool location to avoid too rapid fermentation. Fermentation soon sets in, the temperature of the liquid increases as the process progresses, the clear fluid becomes clouded, the fermentation is gone through in the course of two or three weeks, the wine soon settles and becomes clear, the casks are then filled up, bunged tight and left until February or March, when it is racked off into other casks. Another fermentation again sets in late in the spring. After this is over, the wine is again racked off and is ready for use or sale. Wine rich in sugar may undergo even a third fermentation. It is expedient to protect the wine as much as possible from the oxidizing influence of the atmosphere, which causes a too rapid oxidation of the gluten, and involves a part of the alcohol which it converts into acetic acid. To prevent this, the wine should be exposed as little as possible, either during fermentation, racking off, or in the casks. A method of fermentation has lately been introduced to prevent the influence of the atmosphere during the process. A tin syphon tube is fastened securely in the bung of the cask, the long end of which is placed in a bucket of water. The gases generated by the fermentation are thus allowed to escape, under a slight pressure, but no air admitted, and the aroma prevented from escaping.

"There is a peculiarity in the fermentation of grape juice differing from that of any other saccharine fluid. All the sugar contained in the juice does not pass by one fermentation into alcohol and carbonic acid. Only a portion of the sugar present undergoes this change, although there is ferment sufficient to produce it. As has been said it commences again in the spring, and even a third time, till all the sugar present is converted into alcohol, and the wine becomes what is called a dry wine, and contains no sugar.

"Other complex chemical changes are taking place also during fermentation, the acid of the must acting on some other constituents is forming an ether which gives the wine its peculiar *bouquet*, and the tartar that was held in solution in the original must, as the alcohol increases, is slowly deposited upon the sides of the cask in a crystalline form."

"The next and most important subject will be the wine produced, its characteristics and analysis. The wine is a light, dry, acidulous one; the foreign wine that it most resembles is a dry Hock, *i. e.* in its amount of alcohol, and in being slightly acid to the taste, but the flavor is entirely different. There is a great difference in the color of Catawba wine; some specimens are of a light red or pinkish tint; others of a straw color. The red color is from allowing too much of the skins of the grape to remain in the must, which imparts to the wine a portion of their coloring matter. They also give the wine a rough taste derived from tannin.

"A very great difference is to be observed in the wine produced by different growers, such as deficiency in bouquet, excess of acid, and want of spirit, arising from variation in the weather or want of care or skill in the maker.

"As a general thing the Catawba wine contains much more acid than foreign wines of similar character. This is not because the grapes will not produce as good wine, but is due to want of care in making. The proprietors of many of the vineyards are possessed of but little means, and have not at hand the proper conveniences to protect their wine. This, however, will be remedied in time by the establishment of extensive wine cellars by Mr. Nicholas Longworth, and other men of capital in this city, who purchase the must from the small growers and finish making the wine. This plan not only opens a market for the sale of the must but is a great convenience to the wine grower, and will secure a much greater amount of sound wine.

"A large portion of Catawba wine is also made into champaign or sparkling wine. This branch of trade is rapidly on the increase. The number of bottles annually is 200,000. It is in many respects equal to foreign sparkling wine. In making this, the wine is bottled before the second fermentation sets in, and the bottles placed upon their sides in suitable location and temperature to induce fermentation. The conversion of sugar into alcohol should be allowed to proceed slowly, or the rapid disengagement of gas (carbonic acid) will burst the bottles and cause loss. Under the most favorable circumstances, from 5 to 15 per cent. is lost during the process. The sparkling character is due to the escape of the free carbonic acid held in solution in the wine by the pressure.

"The wine requires to be frequently handled during the process to remove the sediment formed, the removal of which requires much dexterity; the mouth of the bottle is slowly depressed, so that the sediment may fall in a body upon the cork; this is then removed, the thumb placed over the open mouth, the sediment removed from the cork, and the latter then replaced. This operation is so neatly done that but a few drops escape. It requires from 6 to 12 months for the wine to ripen. To the original wine some manufacturers add sugar, but in good wine this addition is unnecessary."

"I have recently seen another kind of Catawba wine entirely different from the ordinary dry wine. This is made from grapes that have been picked and placed upon the floor for several weeks to ripen. A chemical change takes place, they lose a portion of their acid and gain a portion of sugar. The evaporation of a part of the water by drying also makes the juice richer in sugar than that of grapes just gathered. The wine it produces is much stronger in alcohol, and also contains some unchanged sugar. Its taste is peculiar, resembling Madeira, but its parentage is very perceptible. The Germans of Ohio call it straw wine.

"Brandy has recently been made from the lees and marc of the grape. That from the lees is the best. It has the peculiar flavor of the Catawba.

Some specimens have an empyreumatic taste, owing to the distillation being effected by a naked fire. The brandy distilled from the marc has rather an unpleasant taste, and contains a large amount of fusel oil, and an oil derived from the seeds of the grape. This is mellowed down and changed in its character by age. It is perhaps now too new to decide what it may become. Catawba brandy is used medicinally by some of our physicians, more from its being pure, than from any superiority over the foreign article.

The greatest objection to the use of our Catawba wine is its acidity, the average quantity of carbonate of potassa required to saturate the acid present in a gallon of French or Rhine wine of ordinary quality, is from 250 to 260 grains. The average of 19 samples of Catawba wine was 591 grains, some specimens requiring as much as 960 grains. This excess of acid arises from pressing the grapes before they are properly matured, or from pressing the marc too closely, as has been before hinted at."

"Below I give you the analysis of three specimens of wine made by Mr. Ross, by submitting the grapes to three pressings. The wine from the first pressing contained 10.87 per cent. of alcohol, and required 375 grains of potassa to neutralize the acid in a gallon. The second pressing contained 10.90 per cent. of alcohol, and required 450 grains of alkali, the third contained 10 per cent. of alcohol, and required 600 grains of the carbonate per gallon.

"One of the most important facts connected with wine growing—the probable amount of tartar produced—I can give but little information upon. None of the wine growers have taken any interest in this part of their products, and its a difficult matter for them to get at any knowledge of it, as the tartar deposits but slowly, and it is considered to be of advantage to the wine to let it remain in the casks. The amount deposited cannot be ascertained. Catawba wine will produce as much as the wines of Europe, but some time must elapse before it will be produced in sufficient quantity to make it an article of trade. The only information I have obtained is that the wine deposits about 3 lbs. of crude tartar from 100 gallons, which, allowing the present crop to be 400,000 gallons, gives 12,000 lbs. of crude tartar as the present produce, which I presume, is about correct."—*From Proceedings of American Pharm. Association, 1855. See page 487.*

ON A NEW BLISTERING PREPARATION.

By EUGENE DUPUY.

[The following extract, from a letter from our friend Mr. Dupuy, of New York, presents a novelty of its kind.—EDITOR.]

During our pleasant, though too short, interview in New York, I showed you a plastic mass, which, I stated, was prepared with

the requisite proportions of Cantharides necessary for making the Blistering Cerate of the U. S. Pharmacopœia, but containing neither wax, resin nor lard.

A peculiar bitumin, from one of the Western States, was sent to me for examination; its permanent adhesiveness, no matter how long exposed to the action of the air, suggested to me the idea of applying it to the preparation of a blistering plaster. I moistened some powdered cantharides with nitro-benzine, for the purpose of disguising the smell of the flies, and then added the requisite amount of the bitumen. A blistering plaster thus made, seems to possess all the qualities of a good epispastic, with a comparatively pleasant odor.

I doubt not, but this peculiar bituminous exudation could be rendered available in the preparation of other plastic compounds of a stimulant nature, when it is desirable to keep them spread for a long time before they are sold. Should you want a sample of it, I shall be happy to send you some by a convenient opportunity.

CREAM SYRUPS.

TO MR. WM. PROCTER, JR.

Dear Sir:—My experience in reference to the formulæ and to the keeping of the so-called "Cream Syrups," mentioned by you, in the Journal of September last, varies somewhat from those there stated. I flatter myself as one who was among the first to prepare them. I have never used milk, which I think must necessarily diminish their richness. In the preparation of the Cream Syrup, I first make an emulsion of almonds, then the sugar and cream is added, and heated till it comes to a boil, stirring constantly to prevent any separation, (which sometimes occurs, owing to the cream.) This makes a luscious syrup, that will keep a week and over, without being placed in ice. Sometimes a little soda is added, which has the effect to even keep it longer.

I have, since reading the article in the Journal, tried the experiment of preparing Cream Syrup without the emulsion of almonds and without heat, simple sugar dissolved in cream; and, although it makes a nice looking syrup, it did not keep more than three days. Another little matter occurs to me in regard to

either the Cream or Orgeat Syrups, especially as to the last. Many complain that the syrups separate, and I have found it true, both as to some I purchase and as to the other I prepare. This may be prevented by simply keeping it in a bottle having a good cork or glass stopper, and not in one of those mineral water syrup bottles having a metallic cover.

Yours, respectfully,

BRADFORD RITTER.

Oct. 4th, 1855.

ON THE ECONOMICAL MANUFACTURE OF NEUTRAL PER-SULPHATE OF IRON; AND OF DISINFECTING POWDER.

BY CAMPBELL MORFIT, M. D.

As neutral per-sulphate of iron, when associated with plaster and charcoal, constitutes a most efficient deodorizing and disinfecting agent; and its general use being, therefore, desirable, the following method, believed to be new, is proposed for the economical manufacture of it upon a large scale.

Dissolve 100 pounds of copperas in a sufficient quantity of hot water, and while the solution is kept boiling, add, portionwise, 25 pounds of aqua fortis;—taking care that the intervals between the portions shall be long enough to allow the escape of the red fumes arising from the de-oxidation of the aqua fortis by the iron salt. An acid mixture of per-sulphate and nitrate of iron is thus formed.

To get rid of the nitrate and the excess of acid, powdered chalk must be stirred in until effervescence entirely ceases, and the whole left to repose for some hours, when peroxide of iron, free from manganese, will have precipitated with any redundancy of chalk that may have been added. The latter, however, is not in the way for our purpose; and it is, therefore, only necessary to draw off the supernatant liquid and wash once with fresh water. The precipitate is then to be diffused in boiling water, *barely* neutralized with oil of vitriol, evaporated, and brought to pulverulent form by stirring in 500 pounds of charcoal dust and 2000 pounds of ground plaster, and drying in air chambers or by exposure to air.

If it should be required to make pure per-sulphate of iron for

chemical purposes, it is only necessary to omit the charcoal and plaster, and continue the evaporation of the solution to a syrupy consistence, when the sulphate of lime, which it holds, will all crystallize out on cooling. The clear liquid is then decanted into bottles and preserved in that form, as it is very difficult to obtain or keep it in crystals or dry powder.

University of Maryland, Sept. 7th, 1855.

REMARKS ON THE "SARATOGA SALT."

By W. HODGSON, JR.

During the last winter, the writer of this, desiring to furnish to persons at a distance from Saratoga the benefits of that celebrated water in a more portable form and at a more reasonable rate than the bottled water of the Congress Spring, contrived a formula for such a preparation. This was not done hastily or slightly, nor without laborious and continued study; his object being to produce a reliable substitute for the natural water, and not a mere say-so. During the spring, he was able to offer the "Saratoga Salt" to the public, and to the scrutiny of scientific men; and, on the strength of their approval, to announce it as forming, on solution in water, an accurate imitation of the natural "Congress" Spring water; only differing therefrom in containing a small portion of the ingredients for evolving carbonic acid gas; so small as not to be perceptible to the taste, nor to interfere in any degree with its medicinal efficacy. All the constituents of the natural water—even the most minute, and such as have escaped the notice of ordinary analysts—are included in its composition; and the elements are so arranged, and in such proportion, that their combination, when effected by the affusion of the proper quantity of water, cannot be distinguished, in its sensible or chemical properties, from the water of the Congress Spring, and may be safely considered as identical with it.

The "Saratoga Salt" thus brought before the public, being found to answer the expectations of those who tried it, and the demand becoming considerable, the proprietors of the "Congress Spring" appear to have become uneasy, and have issued a Circular to warn "Southerners and Drinkers of Congress Water" against the supposed inroad upon their prerogative. The public,

therefore, may justly claim to be informed in regard to the reliability of the substitute offered.

It would scarcely be expected that the author of this chemical preparation should publicly expose the formula, and thus invite competition by his own hand; although the communication of it, if made, would doubtless satisfy any competent chemist, as it has already satisfied Professors Hare, Booth and Rogers, of this city, that the principles of the preparation are the well-known, simple, unchangeable and infallible laws of chemical combination, applied to the production of certain fresh alliances, and the retention of the new combinations in solution by means of the known solvent powers of carbonic acid. These principles had already guided the writer, in the contrivance of a previous preparation, (analogous to the one now in question,) in which he had successfully imitated the Saline Chalybeate Water of the Cheltenham Spring, in England. The "Cheltenham Salt" thus prepared, elicited the approbation of the authors of the United States Dispensatory, as may be seen by a reference to page 1312, of the 10th edition of that work. By means of the application of these principles to the "Saratoga Salt," the carbonate of magnesia, the carbonate of lime, the carbonate of iron, and even the silica and sulphate of lime, are caught, at the moment of their springing into separate existence as such, and brought into perfect solution. This is, undeniably, in a chemical aspect, a beautiful operation; and, though complicated in its details, yet perfectly simple in its laws, and infallible in its action.

A considerable portion of the Circular above mentioned appears to be aimed at the water of the "Empire" Spring, at Saratoga. The owners of that increasingly popular spring, however, are amply competent to vindicate their water from such vague and transparent aspersions. But with regard to the "Saratoga Salt," the only real argument adduced by the owners of the Congress Spring to support their insinuations and unfounded assumptions, is an expression of Sir Humphrey Davy, which they desire the public to believe implies that such a preparation as might properly claim to be called a "Saratoga Salt," is impracticable. No reference is given, nor any distinct information to enable us to judge under what circumstances the declaration was made, or even, whether it had, after all, any

definite allusion to the Congress water; but Sir H. Davy is quoted as saying:—"It is impossible to recombine [mark that word, *re-combine*,] the ingredients so as to make an article of equal quality, the effect of which will be the same as the natural water." This assertion, however, in relation to Congress water, needs not the great name attached to it, to give it credit; for every chemist, acquainted with the nature of that water, knows well that it would be impossible, after evaporating it to dryness, to "*re-combine*" the ingredients, by re-dissolving the dried natural salt, so as to imitate the natural water. This is all that Sir Humphrey Davy could have meant; as is evident from his using the word "*re-combine*." This we all know cannot be done; and the author of the preparation in question has attempted no such absurdity. But Sir H. Davy never would have said that no chemical combinations could ever be devised, by which the same elements which come together in nature to form the Congress water, might be brought together by art, in a form analogous with that of nature; for he knew otherwise; and his great co-laborer, Faraday, not only knew it, but gave his certificate of approval to a preparation made in England on the very same principles as the Cheltenham Salt mentioned above; as may be seen in the passage in the United States Dispensatory, above referred to. Professor Hare, (late of the University of Pennsylvania,) Professor Booth, (of the Mint of the United States,) and Professor Rogers, (Dr. Hare's successor in the chemical chair of the University of Pennsylvania,) have already given their distinct approval of the principles on which the "Saratoga Salt" is made. Shall we doubt or disregard the judgment of these chemists, because the proprietors of the Congress Spring insinuate or assume that the article should not be relied on?

In regard to their hint in the Circular, that their "old bottles" may be "greedily bought up," for the "purpose of filling them" with the artificial water, they will please to observe that this suggestion to the druggists and other dealers at a distance, came gratuitously from themselves, and not from the manufacturer of the Saratoga Salt.

Should the proprietors of the Spring not be satisfied by the above explanation, let them do me the justice to procure a bottle of the Salt, (each bottle containing enough salt for about two

gallons of the water,) have it properly dissolved in water according to the directions, and have the resulting water carefully analyzed by any well-known, competent and *unbiassed* chemical analyst. Should such a chemist, after careful examination, declare and show, under his own proper name, that this water does not contain the ingredients of the Congress Spring water of Saratoga, and in the due proportion, it will then be more in place for the proprietors to come forth with assertions or insinuations, which, in their application to the present subject, appear to be contradictory to the chemical knowledge and experience of the nineteenth century.

The medicinal effect of the solution of the "Saratoga Salt," the writer has thought it best to leave in the hands of the physicians, confining himself to his own province of chemistry and pharmacy. But it may be well to say that the experience of several of our eminent practitioners has already done much to confirm the identity of this preparation with the natural water.

Dr. Thos. H. Yardley, of this city, speaks on this subject from personal experience, as well as observation in his practice, in the following note, which he permits me to make public:—

"I have myself used, and have been in the habit of prescribing, during the past six months, 'Hodgson's Saratoga Salts,' instead of the bottled Congress Water. I believe their effects are the same; and the facility with which the dry Salts may be carried, renders them a very valuable remedy.

THOS. H. YARDLEY."

"No. 381 Arch st., 9th mo. 28th, 1855."

EXAMINATION OF THE SULPHATE OF QUINIA OF MESSRS. POWERS & WEIGHTMAN, OF PHILADELPHIA.

By EDWARD R. SQUIBB, M. D., U. S. N.

Assistant Director U. S. Naval Laboratory, New York.

MR. WM. PROCTER, JR.

Dear Sir:—Some of the main points in my late paper upon this subject, seem to have been so badly detailed that they altogether escaped the attention of Messrs. Powers & Weightman. Judging from your editorial remarks upon the subject, these must also have been entirely overlooked by you, and probably, therefore, by your readers.

Under these circumstances, I shall be much obliged to you for a little additional space to set forth more clearly these points, and make myself understood.

Messrs. Powers & Weightman say that I acknowledge the statement made in my first communication to have been *practically* and technically incorrect. This is exactly what I did *not* intend to do. The statement was technically incorrect, but not practically incorrect, and the whole object of my last paper was to exhibit the fact, that there was not 10 per cent. of uncombined water in the preparation, but that the preparation was more than 10 per cent. deficient in crystallized disulphate of quinia, or about 10 per cent. deficient in quinia.

Messrs. Powers & Weightman regret that I did not push my experiments still farther to ascertain whether the two atoms of water, calculated as remaining after complete dessication, were really there. This regret is misplaced, for the 3d, 4th and 5th experiments of my paper are directed mainly to this very point; and a comparison of their results shows that the same impure effloresced sulphate of quinia, which, when dried at 242° , lost 5.431 per cent. (Exp. 3.) yielded on subsequent analysis 8.53 per cent. of water. (Exps. 4th and 5th.)

Then $8.53 - 5.431 = 3.099$ = the percentage amount of water still retained by the salt when dried at 242° .

This 3.099 per cent. of water happens to be exactly 1.5 equivalents. With the pure recrystallized sulphate the results were very different. In it "nearly the whole of the water of crystallization" was "driven off at a temperature short of fusion." (Exps. 3d, 6th and 7th.)

All authorities agree that crystallized disulphate of quinia requires 30 times its weight of boiling water for complete solution, whilst this commercial salt is soluble in 23.96 times its weight, or less. (Exp. 2d.)

The influence of air and a temperature of 242° , does not alter quinia when in combination with a fixed acid, and not in solution. If the simple processes of an examination under the influences of heat and air are inadmissible, we must, of course, give up research into the purity of the preparation.

If my statements with regard to the impurities of the mother liquor are "very indefinite" to Messrs. Powers & Weightman, it

is because I refrained from saying anything in regard to them that was not based upon accurately detailed experiment.

If, however, my deductions and conclusions in regard to them are needed to render the remarks more definite, I have certainly no objections to state them, qualified by the remark that I did not take the time and trouble that would be necessary to satisfy others than myself upon their precise character. I believe the impurities of the mother liquor consist chiefly of disulphate of quinidia, and of neutral sulphates of quinidia and quinia. The last two salts contain, respectively, 12 and 16 equivalents of water of crystallization, and when dried at 212° , lose, respectively, 19 and 24 per cent. of water. (Pereira, vol. 2, pp. 672 and 674.)

I have very recently noticed that in the translation of Wittstein's Practical Pharmaceutical Chemistry, the composition of crystallized disulphate of quinia is given as containing 10 eq. of water, the points of solubility and reactions common to other authorities being retained. Whilst "Ch. Linck has found (Liebig & Kopp's Annual Report, 1850, vol. 4, p. 284,) that the sulphate of quinia of commerce possesses the formula, $2C_{20}H_{12}NO_3, HO, SO_3, + 4HO$, (9.8 per cent. of sulphuric acid, and 8.4 per cent. of water of crystallization) the 4 eqivs. HO escape at 130° ," ($266^{\circ} F.$?)

In reply to your editorial remark, I cannot undertake to examine the sulphate of quinia of any other manufacturers until I have occasion to use their preparations, for I have not the time allotted to me to study the interests of Pharmacy farther than they are immediately connected with my present duties. Should I have made such examinations, however, and have found the preparation of Messrs. Powers & Weightman preferable to all others, it could not certainly change my belief that in this best preparation there is room for much improvement. It is the cause and interests of medicine and pharmacy that I wish to defend; for if it was the interests of Manufacturers that I wished to attack, there are many, doubtless, more vulnerable than those of Messrs. Powers & Weightman.

Very respectfully,

Your obed't serv't.

E. R. SQUIBB.

U. S. Naval Laboratory, New York, September 24, 1855.

LETTER FROM MESSRS. POWERS AND WEIGHTMAN RELATIVE
TO THEIR SULPHATE OF QUINIA.

MR. W. PROCTER, JR.

Dear Sir,—Dr. Squibb's third article on the sulphate of quinia, prepared by us, seems to call for a few remarks which we will thank you to permit to accompany his communication.

His first communication on the subject, we considered calculated to produce the impression that we had, by some skill in chemical manipulation, succeeded in crystallizing sulphate of quinia with 10 per cent. more water than its acknowledged atomic constitution, and were defrauding the public by selling such an article. To this conclusion, we set off our own experiments by which we obtained very different—but to us satisfactory—results; besides taking exception to the terms of his conclusion.

His second article we did not follow in detail, as he remarked himself that the deductions from the results of his three first experiments were very much confused by the results that followed in his subsequent ones.

About the solubility of sulphate of quinia in boiling water, we had generally considered that 30 parts of water to 1 of it, was pretty accurate, but now submit some results differing from this.

100 parts of sulphate of quinia were added to 2850 parts of distilled water, and boiled; the salt did not immediately dissolve, but upon continuing the ebullition a few minutes, it dissolved entirely. The boiling was continued and the solution weighed from time to time, until, after more than an hour's boiling, the water had become reduced to 1500 parts, plus 100 of sulphate, making 1600 of solution; beyond this point it began to form crystals, which by no subsequent continuance of the boiling could we succeed in redissolving. The boiling was conducted in an egg shaped flask with a long neck, and the flask and contents were weighed together, to ascertain the loss of weight. The quinia was previously tested by ether and ammonia, and gave no indication of cinchonia or quinidia. What occasioned this increased solubility? If a modification of the alkaloid, what change had taken place? With this we leave the intelligent readers of the Journal to form

their own opinions as to what effect had been produced by the continued boiling of Dr. Squibb's experiment.

Had Dr. Squibb stated, in either of his former articles, what he now states in this, that the impurities consist in *his opinion* chiefly of disulphate of quinidia, and of neutral sulphates of quinidia and quinia, we certainly never should have troubled your readers with any communication from ourselves on the subject.

A word also about our pecuniary sensibilities. We consider ourselves perfectly justified in defending our reputation, and as a consequence, our interests. With equal propriety might we refer to the circumstances which called into existence the U. S. Naval Laboratory. The outcry about the adulterations of drugs, chemicals, and medicines, to which it was mainly indebted for its establishment, we are satisfied, has been very much magnified. Our long acquaintance with most of the wholesale druggists has convinced us of their fair dealing and general rectitude.

Very respectfully yours,

POWERS & WEIGHTMAN.

* A NEW WET ASSAY OF IODINE AND ITS COMPOUNDS.

By FERD. FEIST MAYER.

1st. If a solution of sulphate of peroxide of copper, blue vitriol, be brought into contact with that of an iodide, a decomposition takes place, one half of the iodine present forming insoluble protoiodide of copper, and the other becoming free $[2 (\text{CuO SO}_3) + 2 \text{MI} = \text{Cu}_2\text{I} + \text{MO SO}_3 + \text{I.}]$ On adding to the mixture thus formed a solution of protosulphate of iron in equal (that is, equivalent) proportions to that of copper, the iodine set free will unite with another part of peroxide of copper and the oxygen of the latter with part of the protoxide of iron, to form peroxide.

The same reaction, without any loss from free iodine by volatilization, takes place on adding the solutions of the sulphates already mixed, in the proportion of 2 at. of the coppersalt and not less than 2 at. of that of iron to that of (1 at.) iodide. $[(\text{CuO SO}_3) + 2 (\text{FeO SO}_3) + \text{MI} = \text{MO SO}_3 + \text{Fe}_2\text{O}_3, 3 \text{SO}_3 + \text{Cu}_2\text{I}].$

2d. The protoiodide of copper, Cu_2I , on being heated with a solution of caustic potash or soda, or their carbonates, forms iodide of potassium or sodium, and protoxide of copper. ($\text{Cu}_2\text{I} + \text{KO} = \text{KI} + \text{Cu}_2\text{O}$).

8d. The protoxide of copper, treated with a solution of perchloride of iron and hydrochloric acid, is converted into peroxide of copper, which dissolves in the acid, the oxygen necessary being taken from an equivalent amount of the peroxide of iron ($\text{Fe}_2\text{Cl}_3 \text{ Aq.}$) present.

On either of these reactions a centigrade analysis of soluble iodides or iodine may be founded, which is very simple and the more accurate since in itself it furnishes the means for three distinct determinations, each one serving as control to the other, and at the end of the operation leaves all the iodine acted on in the state of iodide of potassium ready for crystallization.

The reagents employed are the following:

1. Crystallized permanganate of potassa, which is prepared in the most convenient manner from binoxide of manganese, potash and chlorate of potassa, according to Gregory (v. Gmelin's Handbook, Vol. II.), and which may be dissolved to any desired strength in distilled water.

2. A solution of the sulphates of peroxide of copper and protoxide of iron. Both the commercial salts commonly contain, as their principal adulteration, one of the oxides of iron. Neither will in the least endanger the success of the assay, if, before adding it to the iodide, the amount of protoxide of iron be ascertained by means of a standard solution of permanganate of potassa. A perfectly pure protosulphate of iron, however, is that obtained in the preparation of sulphuretted hydrogen from sulphide of iron and sulphuric acid. Commercial bluestone, again, is readily purified by igniting the salt in the form of a coarse powder, moistened with common nitric acid in a Hessian crucible at a red heat and lixiviating when cool. But the easiest method of preparing those sulphates in the manner required is to boil them for a short time in a sufficient quantity of water, slightly acidulated by sulphuric acid, with some copper filings, when all the peroxide of iron present will be reduced to protoxide by the metallic copper, and the peroxide of copper formed be dissolved by the excess of acid.

A solution of this kind, slightly acid and with some metallic copper immersed in it, will keep any length of time without showing the least formation of peroxide of iron, all that might be formed by atmospheric influences being immediately upon its formation reduced by the copper; besides, the amount of sulphate of copper does not come into consideration, since only that of protoxide of iron is required to be constant.

3. A solution of caustic potash, the strength of which is ascertained on alkalimetric principles (by oxalic acid, see below). It may be kept perfectly free from carbonic acid on proceeding in the following manner, as proposed by Mohr. The bottle containing the liquor is closed with a good cork boiled in wax. This holds a common chloride of calcium tube, open at both ends and filled with a mixture of caustic lime and glauber salt, which, according to Graham, entirely prevents the passage of atmospheric air or, what in this case is the same, carbonic acid, to reach the caustic liquor. From this bottle any desired quantity of potash may be drawn without opening it, by fitting into it a glass tube, bent so as to form a syphon, the inside arm of which reaches to the bottom of the bottle, and the outer somewhat below that, having one of Mohr's brass-clamps affixed,—for a description of which the reader is referred to an elaborate paper on improvements in alkalimetry by the inventor in Liebig's *Annalen der Chemie u. Pharmacie*, lxxxvi., 129, Dingler's *Polyt. Journal*, cxxxii., 42, also *London Pharm. Journ.* xiii., 287.

4. A solution of oxalic acid. For the advantage of this over sulphuric acid we refer as above.

5. A solution of perchloride of iron, which is prepared free from nitric acid or protochloride of iron by dissolving the *caput mortuum vitrioli*, the *ferri peroxidum* of the *Dublin Pharmacopœia*, to saturation in strong muriatic acid. The quantity of peroxide of iron it contains is ascertained and regulated by means of the permanganate of potassa, according to Marguerite.

The following are the manipulations and the rationale of the assay itself:

When iodine is to be tested, it is obtained in solution, by heating it with metallic zinc under water, in the form of iodide of zinc.

Commercial iodide of potassium to be examined must be free from carbonates, which, if present, are removed by the careful addition of sulphuric acid.

Liquids containing hydrothion, free or combined, as is frequently the case with the kelp or varec-lyes, are evaporated to dryness with an excess of hydrochloric acid. (Penny).

I. One equivalent I (126 grammes of the weed-lyes, 12.6 of richer liquids, 1.26 of iodine or iodides in substance,) is treated with a sufficient quantity of the solutions of sulphates (160 grammes of Cu OSO_3 (anhydrous,) and at least 150 of FeO SO_3). The precipitate of protoiodide of copper, which is almost white in the cold, turns to a light brown by heating, and settles readily, when the supernatant liquid may be decanted from the precipitate, which is to be well washed. A filtration is, in most cases, not needed. To the clear liquid a solution of permanganate of potassa is added from a burette, containing in 100 cubic centimeters, one fifth of an equivalent of the salt to every 2 equivalents FeO SO_3 added, $\frac{159.3}{5} : 150$. The reaction is finished when the color of the liquid changes suddenly to a bright red, that is when all FeO left is converted into Fe_2O_3 . The number of cubic-centimeters of the manganic solution not added, gives directly the per-centage of iodine in the substance to be tested.

II. The well washed precipitate of protoiodide of copper is now treated with a solution of caustic potash, 100 cc. of which are accurately neutralized by the same volume of a solution of oxalic acid, containing one equivalent (63) of the latter. The difference in the amount of caustic alkali for and after the reaction gives in direct numbers the percentage of iodine in the original substance.

III. The brownish protoxide of copper obtained in II., which may be separated from the alkaline solution of iodide of potassium by filtration or decantation, is treated in the water-bath (or over the spirit-lamp) with a measured volume (or weight) of a concentrated solution of perchloride of iron and hydrochloric acid, avoiding too large an excess of either. The clear liquor is then tested by means of permanganate of potassa, and if the strength of the solution of the latter be such that the quantity of FeO (72) which is reduced from (80) 1 At. Fe_2O_3 (or Fe_2Cl_3) by (72) 1 At. Cu_2O , is accurately reoxidized by one hundred c.c.: the

percentage of iodide is again found in the number of centigrades employed.

NOTE.—The alkaline solution of the iodide of potassium is freed from sulphates and oxalates by treatment with hydrate of lime,

ON ADULTERATED OIL OF ANISEED.

BY WILLIAM PROCTER, JR.

A few weeks ago, a drug house of this city received a small invoice of oil of aniseed from New York, purporting to be in original packages. On opening one of the cans, they were led to suspect its purity, and requested me to examine it for them. The following results were obtained:—

1st. Its color and odor were correct, except that the latter was not as decided as it should have been.

2d. Its specific gravity at 68° Fahr., carefully ascertained, was .8626, whilst that of a fair commercial oil of anise was .9820. This great levity indicated the presence of some lighter substance.

3. In a graduated tube, accurately divided into sixty parts, the suspected oil was poured until it arose to the 30th division, water was then poured in till it arose to the 60th division. By contact of the water, the oil instantly became milky, and when the mixture, after being shaken, was allowed to stand several hours, it consisted of two layers. The sub-stratum was oily yellow-colored, and occupied six divisions of the measure; the super-stratum, occupying the remaining fifty-four degrees of the measure, was colorless and transparent, and burned with a pale blue flame on a glass rod. This was decanted, and distilled to one-half. The distillate instantly inflamed when brought in contact with a lighted lamp, and burned without residue. When added to a dilute mixture of bi-chromate of potash and sulphuric acid and boiled, the yellow mixture became green, as when alcohol is present, which was undoubtedly the case.

4th. As the specific gravity of the oil in question was .8626, and that of a fair commercial oil .9820, and the admixture with water indicating about one-sixth of true oil and five-sixths of alcohol, the following equation will show that the two experiments corroborate each other, thus,—.9820 (sp. gr. of the true

oil,) + (.835 (sp. gr. of alcohol,) $\times 5$) $\div 6$ = .8590, which is sufficiently near .8626 to be admitted.

This is one of the boldest instances of adulteration that has occurred, and points to the necessity of our wholesale dealers being on the look-out. As the transaction was through a drug broker, we had no means of knowing the name of the New York party.

EMPLASTRUM ARNICÆ.

By THE EDITOR.

Notwithstanding the ill repute that arnica flowers have attained among many medical writers, the tincture of arnica has been of late years becoming more and more popular, as a domestic application to bruises and sprains, and some physicians esteem it highly for the same purposes. Arnica *plaster* has also come into use as a strengthening plaster for the back, and, as an application to painful or sprained joints, it has become quite popular. As no formula for the plaster has, so far as we know, transpired, the following recipe is given :

Take of Arnica flowers,	one pound, (Troy.)
Alcohol, (.835)	three pints,
Water,	one pint,

Adhesive plaster (Emp. Resinæ.) twenty-two ounces (Tr.)

Mix the alcohol and water together, and pour two pints of the mixture over the arnica, previously bruised finely, allow it to stand for 48 hours, pack it in a percolater, and pour on slowly the remainder of the alcohol until three pints of tincture are obtained. Evaporate this tincture in a water bath (or still,) till reduced to a soft resinous extract (weighing about two ounces and a quarter,) and incorporate it by stirring, with the adhesive plaster previously melted, and form it into rolls.

Thus prepared arnica plaster has a deep yellow brown color, is uniform in texture, spreads easily and is adhesive. Where the tincture is ready made, it may be used in the same ratio viz: Oij. to 22 oz. of Resin plaster, but it is necessary that the strength be similar to the above.

ON EXTRACTUM CIMICIFUGÆ FLUIDUM.

To the Editor of the American Journal of Pharmacy :

Having frequent calls for the above preparation in this city, and not having seen any published formula* for it, I offer the following result of a series of experiments suggested by my friend Mr. Thomas S. Wiegand.

Take of Cimicifuga in coarse power,	℥viii.
“ Ether,	f. ℥iv.
“ Alcohol,	f. ℥viii.
“ Dilute Alcohol, q. s.	
“ Water, q. s.	

Mix the ether and alcohol, and digest the root in the mixture for 24 hours. Then transfer to a displacer and displace 12 fluid ounces, adding dilute alcohol to make up the quantity, which should be stood aside to evaporate spontaneously to five fluid ounces. Continue displacing with diluted alcohol till eight fluid ounces have passed, then mix the two tinctures together, digest the residue left in the displacer, for one hour in boiling water, strain and evaporate to two fluid ounces, mix it with the tincture, and after standing forty-eight hours filter.

This preparation contains all the active principles of the root, and with a little care can always be obtained of a uniform, strength.

Trusting this may be of some benefit to the profession,

I am yours respectfully,

Baltimore, Oct. 2d, 1855.

JAMES C. LEAMY.

ON ACONITE AND CHLOROFORM LINIMENTS.

(BY A CORRESPONDENT, WITH A NOTE BY THE EDITOR.)

To the Editor of the American Journal of Pharmacy :

DEAR SIR :—Availing myself of the privilege given subscribers in a former number, I would ask the explanation of a phenomenon developed in compounding the following prescription :

* [NOTE. The author has overlooked our formula published at page 107 vol. 26th of this Journal, (March, 1854,) which is similar to the above, except the aqueous treatment. EDITOR.]

R. Tinct. Aconiti,
 Chloroform.
 Adep. Suille, aa. 3ij.
 Tinct. Sapo. comp. 3j.
 Aquæ. Ammon. 3ij.
 Misce et ft. Lin.

Uniting the aqua ammonia and adeps to form a liniment and adding the tinct. sapo. comp. &c., seemed to be the proper mode of procedure; this, however, precipitated the lard. Why is it? The liniment, however, was handsomely formed afterwards by pursuing the following form:

Make a liniment of the lard and water of ammonia—triturate and add the chloroform—triturate and add the tincture of aconite,—triturate and add the comp. soap liniment. I sought an explanation from the maker of the prescription—he could give none. The chloroform is evidently the bond of union between the tincture and ammoniated liniment—but as regards the *rationale*, I am in the dark. Respectfully submitted,

Baltimore, Oct. 6th, 1855.

“LÆNO.”

NOTE BY THE EDITOR. As our correspondent “Læno” has requested a “rationale” of the above experiments, they were repeated in several different ways to enable us to speak of them intelligibly, although we had made analogous mixtures before.

1st. When lard and solution of ammonia are triturated together, an imperfect ammonia soap results; when the camphorated tincture of soap is added the latter abstracts the water and most of the ammonia, whilst the lard, but slightly altered, separates, owing to its insolubility as “Læno” states. If now the fluid portion is poured off from the fat and the chloroform added to the latter, they unite to form an opalescent solution, which when added, with the tincture of aconite, to the liquid in the bottle, forms a mixture by agitation, as capable of being used as a liniment as a mixture of chloroform olive oil and soap liniment would be, yet which soon separates on standing into two strata, the inferior being the lard and chloroform, whilst the superior consists of the tinctures and ammonia.

2d. Following the order suggested by “Læno” as yielding a better mixture, we found that all worked well until the tinctures were added to the fatty mixture, when the separation took place as in the other instance, although not so quickly, but quite as completely. This mixture is somewhat improved by gently heating the lard and chloroform till a clear solution is effected, and then adding the other ingredients previously mixed in a graduated measure and agitating.

The reason of this separation is evidently the greater affinity of the chloroform for the fatty matter than for the alcohol, weakened as it is by the solution of ammonia, and hence the lard and chloroform act mechanically as if they were a homogeneous heavy oil.

3d. After having thus endeavored to answer "Læno's" query, it may not be out of place to suggest a modification of the above prescription which overcomes the difficulty completely.

R.	Olei Ricini,	.	.	.	3ij
	Chloroformi				
	Spiritus Ammoniaë				
	Tinctura Aconiti Radicis	aa.		f. 3ij	
	Tinctura Saponis Camphoratæ			f. 3j	Misce.

In combining these ingredients but little care is needed, but perhaps the better method is to weigh the oil in the vial, add the chloroform (by measure) and mix them, then measure the other ingredients, mix them and add the mixture to the oil and chloroform. If a perfectly homogeneous solution is not obtained at once, a few moments heating in a water bath will effect it.

As both castor oil and its ammonia soap are soluble in the tinctures, the rationale is self-evident. By thus using castor oil, the trouble attending the employment of a mortar is avoided, and a much more scientific compound obtained. It may not be out of place to suggest to physicians, in all prescriptions of this class, where it is desirable to unite a fatty vehicle with chloroform or ammonia, (or both,) and tinctures, that castor oil from its solubility in alcohol offers advantages over any other equally bland fixed oil.

ON THE GELATINIZATION OF ETHER.

By M. GRUNAU.

At a time when the question of local anæsthesia attracts more and more attention, I think it may be useful to make known to practitioners a very simple method of *gelatinizing* ether, which avoids the numerous inconveniences resulting from its great volatility, allows of its action being localized, as well as prolonged as much as may be desirable, without requiring constant surveillance. By the use of the new preparation, we may more easily judge of the anæsthetic action of ether apart from its refrigerant effect, this latter being almost null even when the jelly is employed in the free air.

If we put together into a stoppered bottle, four measures of ether with one measure of white of egg, and briskly agitate them together, the albumen will be soon seen to swell considerably, and by degrees to absorb the entire quantity of ether, forming

with it a thick collodion, which is soon transformed into an opaline, trembling jelly, detaching itself from the sides of the bottle without separating into the two ingredients of which it is constituted. This jelly, much more easily operated with than ether, and without any adherence, is spread with the greatest facility, disengaging but slowly the volatile liquid of which the major part of it is formed. Applied to the skin, and covered with a band of cloth, or still better of caoutchouc, it speedily causes rubefaction without producing by its contact any symptom of vesication. When it begins to dry, a new layer may be applied, and there may thus be submitted to the prolonged action of ether, either exposed to the air or covered, a part of the body more or less extensive, by the means that are employed in the administration of a cataplasm or a sinapism.

The jelly ought to be prepared as required, for the action of ether on albumen continues some time, bringing about by little and little a solidification more and more complete.

By immersing the bottle in water at 158° Fahr., an almost instantaneous solidification is obtained, without the separation of the ether.

1. The proportion of four parts of ether is the strongest which I have succeeded in absorbing by one part of albumen. In fact, to prepare the jelly more rapidly, it would be better to increase a little the proportion of albumen.

2. For the preparation of a fine and homogeneous jelly, it is requisite to use ether that is pure, or at least such as is free from alcohol and acid. This may be obtained from the ether of commerce by agitation with water and magnesia.

3. If circumstances require, various substances may be dissolved in ether—as, for example, cyanide of potassium, camphor, morphia or conia, &c.—and the gelatinization may afterwards be effected.—*London Pharm. Journ.*, from *Journ. de Chimie Médicale*, Sept., 1855.

ON THE DEODORIZING AND DISINFECTING PROPERTIES OF CHARCOAL, LIME, SAND, AND GRAVEL.

A letter appeared in *The Times* of August 22d, addressed by Dr. Sutherland to the Earl of Shaftesbury, on the sanitary

measures which have been adopted for the benefit of our army in the Crimea, in which allusion is made to the use of charcoal, lime, sand, and gravel, for deodorizing and disinfecting purposes. Our attention has been directed to this letter by a correspondent, who thinks Dr. Sutherland is wrong in classing sand and gravel with charcoal and lime for the purposes specified. He enquires whether the action of sand and gravel is not purely mechanical, while that of charcoal and lime is chemical. The subject is one of considerable interest and importance, and one on which some difference of opinion may exist.

Dr. Sutherland says, they use three deodorizing substances—charcoal, lime, and sand or gravel; that charcoal acts extremely well, and in small quantity; that lime also acts very well; and that sand or gravel, for certain purposes, is as good as either, but that a large quantity of this is required to produce the effect, and therefore its use is limited by the difficulty of carriage. He further states that any one of these substances would, he believes, act as a disinfectant, if a proper quantity were used. Lastly, he says that charcoal, in any ordinary quantity is not a disinfectant.

We are not prepared fully to adopt this opinion, but at the same time we do not think it is subject to the objection urged by our correspondent. There is reason to believe that a substance may act completely as a deodorizer while it acts but imperfectly, if at all, as a disinfectant. Dr. Sutherland adduces evidence in confirmation of this view. He says that a ship which took charcoal to Balaklava, having occasion to lay for some weeks in the harbor, close to the wharf, and not far from large accumulations of foul matter, had several cases of cholera on board, although the cargo was being discharged, and the men and every part of the vessel were covered with the dust of the charcoal, bags of which charcoal were piled up on the wharf close to the vessel. In this case, the charcoal completely deodorized but did not disinfect the air on board the vessel; and to get rid of the disease it was found necessary to send the ship out of the harbor. Dr. Sutherland suggests that when charcoal is used in the ordinary quantities for deodorizing purposes, it would be wise not to apply to it the term “disinfectant,” as it might lead to undue expectations, and cause other more efficient measures for disinfection to be neglected.

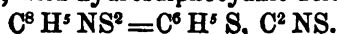
It is certainly a very important question to be determined, whether, and in what way, or to what extent the offensive odor of decomposing organic matter is connected with infection. We agree with Dr. Sutherland that the terms deodorizer and disinfectant ought not to be commonly used in connexion, as if the one effect necessarily followed the other. In fact, we know very little about infection, its real nature and the *modus operandi* of those substances which have been found or supposed to prevent contagion. It is generally considered that the poison of contagion is destroyed by a process of oxidation, a process similar to that by which offensive odors are usually got rid of. Admitting this, however, it does not follow that the two effects should be necessarily simultaneous.

Charcoal and lime are two of the best known substances for preventing the escape of offensive odors from decomposing organic bodies; but these two substances do not act in precisely the same way. The action of the charcoal, in as far as the charcoal itself is concerned, is mechanical, that is to say, the charcoal does not enter into chemical combination with any of the elements present. On the other hand, the lime combines with some of the products of decomposition. But the true, most active, and efficient agent in destroying contagion, is atmospheric oxygen. Charcoal possesses the property in a very high degree of condensing gases upon its surface, and it is thus capable of bringing large quantities of atmospheric oxygen, in an active state, into contact with the noxious products of organic decompositions, and causing their destruction by an oxidizing action. The action of sand or gravel would be somewhat similar to that of charcoal, but with this difference, that sand and gravel are deficient in that property, which so remarkably distinguishes charcoal, of condensing gases on their surface. The sand or gravel acts simply as a porous mass, the interstices of which are filled with air, and the gaseous products of decomposition, on passing through this mass, are minutely divided and brought into intimate contact with atmospheric oxygen. Dr. Sutherland says, that a stratum of six inches thick of sand placed over ground filled with decomposing bodies entirely deodorized the soil. In this case we have no doubt the action of the sand was such as we have described.—*London Pharm. Journ.* Sept., 1855.

ON THE ARTIFICIAL PRODUCTION OF THE ESSENTIAL OIL OF MUSTARD.

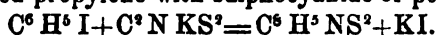
By MM. BERTHELOT AND DE LUCA.

The authors refer to the investigations of many chemists for the last thirty years upon the nature of essence of mustard, and especially to the researches of MM. Dumas and Pelouze, who in 1833 analysed it, determined the density of its vapor and its principal properties, and discovered the finely-crystalline body thiosinamine, prepared by the action of ammonia upon the oil of mustard; and to those of M. Wertheim, who has shown that this essence, $C^8 H^5 NS^2$, may be regarded as a compound of oil of garlic, $C^6 H^5 S$, with hydrosulphocyanic acid,—



Upon the preceding data the authors proceed to obtain essence of mustard without the aid of any substance derived from cruciferous plants, by taking glycerine as a starting-point. In a recent memoir, they showed that glycerine treated with iodide of phosphorus furnished iodized propylene, $C^6 H^5 I$. The formula of essence of garlic, $C^6 H^5 S$, only differing from that of iodized propylene in the substitution of sulphur for the iodine, all that was necessary was to effect this substitution, and then to combine the product with hydrosulphocyanic acid, in order to produce oil of mustard.

This double reaction was effected at a single operation by treating iodized propylene with sulphocyanide of potassium,—



The reaction is completed in a few hours at $212^\circ F$. in a close vessel; essence of mustard and iodide of potassium are the principal products obtained.

The liquid produced possesses the known properties of essence of mustard; it exerts the same irritating action upon the eyes and skin, boils at the same temperature, and when treated with ammonia furnishes thiosinamine in the same manner,—



The composition of thiosinamine thus prepared is,—

	Found.		Calculated.
C . . .	40.9	8	41.4
H . . .	7.0	8	6.9
N . . .	28.0	2	24.1
S . . .	28.0	2	27.6

This thiosinamine agrees in composition, properties, and crystalline form with that obtained from the natural essence.

This origin of essence of mustard from iodized propylene, a derivative of glycerine, shows that essence of garlic may be derived from propylene, C^6H^6 , one of the carburets corresponding with the alcohols; essence of garlic is sulphuretted propylene, and essence of mustard is sulphocyanide of sulphopropylene. This result will no doubt lead to the production of similar compounds from other carburets homologous with propylene, especially from olefiant gas; and the authors intend making some experiments in this direction.

They add, that from the relation between glycerine and essence of mustard established by their experiments, it appears that the latter may be formed by means of the neutral fatty substances, which are so abundant in vegetables, and especially in the Cruciferae; this will probably throw some light upon the origin of the natural essence.—*Chem. Gaz., from Comptes Rendus*, July 2, 1855, p. 21.

ON HYDRAULIC LIMES, ARTIFICIAL STONES, AND VARIOUS NEW APPLICATIONS OF THE SOLUBLE ALKALINE SILICATES.

By F. KUHLMANN.

Theory of Hydraulic Limes.—The author commences by observing, that all limes, and especially hydraulic limes and natural cements, contain considerable quantities of potash and soda. In a memoir read before the Academy of Sciences on the 4th of May, 1841, he considered that these alkalies served to transfer silica to the lime, so as to form silicates, which, when in contact with water, solidify a part of this body by a process of hydration analogous to that of plaster. In support of this theory, he instances the immediate transformation of common lime into hydraulic lime by simple contact with a solution of silicate of potash. If, during the burning of a limestone, potash is in contact with silica, the silicate formed must necessarily react, if only at the moment when the burnt lime is brought in contact with water.

Further experiments have proved, that by mixing common

lime with an alkaline silicate, both finely powdered, in the proportion of 10 or 12 parts of the latter to 100 of the former, a lime is obtained presenting all the properties of an hydraulic lime. If the materials were not well pulverized, the reaction would be incomplete, and an effect subsequent to the solidification would soon cause a disintegration. Thus an hydraulic lime of which the strength may be varied at will, may be immediately prepared with lime and a silicate; and this will allow of the economical formation of hydraulic constructions in places where there is no hydraulic lime.

Silicatization; Artificial Stones.—From this the author was led to examine the action of the alkaline silicates upon calcareous stones; and the result of his experiments leads him to expect that in this direction the alkaline silicates may be extensively applied to purposes of utility. By suspending powdered chalk in a solution of silicate of potash, a cement is obtained which hardens slowly in the air, acquiring sufficient hardness to be capable of application under certain circumstances in the restoration of monuments, the manufacture of mouldings, &c.

Chalk, either in the natural state or in the form of an artificial paste, when immersed in a solution of silicate of potash, absorbs a certain quantity of silica even in the cold; and this may become considerable by exposing the stone several times alternately to the action of the siliceous solution and to the air. The chalk acquires a smooth appearance, a close grain, and a color more or less yellowish, according as it is more or less ferruginous. Stone thus prepared is susceptible of a fine polish; and the hardening, which at first is superficial, penetrates by degrees to the centre, even when the stone is of considerable thickness. The process may be employed in formation even of very delicate sculptured ornaments, for when the chalk is very dry, which is essential for the production of good results, the surface undergoes no alteration during silicatization. Thus ornaments of great hardness and unalterable by moisture may be obtained at very small cost, and merely washing ancient monuments formed of soft limestones with a solution of silicate of potash, will preserve them from further decay; the same process may have a still more general application in countries, like Champagne, where chalk is almost the only building material. Since

1841, when these views were first put forward, they have been adopted in practice to a considerable extent.

In the hardening of the siliceous limestones, the carbonic acid of the air appears to separate a part of the silica; and the portions which are in contact with a sufficient quantity of carbonate of lime, pass to the state of silicate of lime.

The author's memoir of 1841 indicated many industrial applications of the artificial injection of mineral substances into the interior of porous bodies, whether organic or inorganic. In the present paper he gives a new series of observations.

The silicization of sculptures and buildings gives rise to colorations of the stone, which are often very considerable, and render the joints and veins more distinct. In getting rid of this inconvenience, two essential points are to be fulfilled,—chalk walls remain too white, whilst certain ferruginous limestones acquire dark tints. The silicization of white limestones is effected with a double silicate of potash and manganese. This is a vitreous substance of a deep violet color, which furnishes a brown solution, and this applied in silicization, deposits a little oxide of manganese in the artificial siliceous paste. Oxide of cobalt also combines, but in smaller quantity, with the silicate of potash; the silica precipitated by a current of carbonic acid is of a fine azure-blue, and this silicate may be employed in the treatment of white marbles. When the stones are too dark, which is the most general case, excellent results may be obtained by suspending in the solution of silicate, small quantities of artificial sulphate of baryta, which, penetrating into the porous stone, at the same time with the formation of the siliceous layer, remains there, entering into a state of chemical combination. The joinings may be made with ordinary cements, lightened in color with white substances; but they may be more completely concealed by fragments of the stone itself, mixed with the vitreous silicate of potash, the whole very finely pulverized, and applied in the form of a liquid paste.

Coloring of Stone.—Stones may be tinged of various colors by impregnating them with certain metallic salts, and afterwards producing precipitates of colored compounds. Thus by impregnating stones with salts of lead or copper, and bringing them in contact with sulphuretted hydrogen gas of hydrosulphate of am-

monia, gray, black, or brown shades may be obtained at will. Salts of copper and ferrocyanide of potassium give coppery tints, &c. When porous limestones, and other bodies of analogous composition, are boiled in solutions of metallic sulphates with insoluble oxides, an evolution of carbonic acid takes place, accompanied by a fixation, at a considerable depth in the stone, of the metallic oxides, which enter into an intimate combination with the sulphate of lime. When the oxides are colored, very pure tints are obtained in this manner. With sulphate of iron, rusty tints of greater or less depth are produced, according to the strength of the solutions; with sulphate of copper the stone receives a fine green tint; sulphate of manganese gives a brown, and a mixture of the sulphates of copper and iron a chocolate color. The author has also experimented with other sulphates, and with mixtures of them. The affinities which cause these reactions are so powerful, that with some sulphates, such as that of copper, the oxides are so completely absorbed, that after boiling with an excess of chalk, no appreciable trace of them is left in the solution. In operating upon mixtures of sulphate of copper and iron or manganese, the oxides of iron and manganese are the first to be precipitated. The sulphates with colorless oxides furnish analogous results, as does also biphosphate of lime.

In most cases, in order to employ tinted stones in building or in the formation of mosaics, it will be advisable to increase their hardness by silicatization. The same will apply to shells, white coral, &c., which may be colored by the same processes, by operating at different pressures.

The double sulphates formed while penetrating into the stone, enter into its composition, and increase its hardness to such an extent, that by the employment of certain sulphates, such as that of zinc, silicatization is rendered less necessary.—*Chem. Gaz., from Comptes Rendus*, June 25, 1855.

CHEMICAL EXAMINATION OF THE CHRYSOMELA ÆNEA.

By J. B. ENZ.

In the year 1850, Liebig made the observation that the larvæ of *Chrysomela Populi* contains salicylous acid. Schneider has noticed the occurrence of this acid in larvæ collected upon wil-

lows, and thinks, like Liebig, that it is formed from the salicine which the creatures take in with their food.

This remarkable phenomenon has induced the author to examine another species of the same genus, namely, the *Chrysomela cenea* (Alni, Oken), which lives on the leaves of the alder. He found that these animals contain all the materials of the leaves, many of them however in a modified form. Of the tannin, which gives a blue color with iron, and which the leaves contain in abundance, no trace was to be found in the beetles; and the author therefore thinks that the tannic acid is decomposed in the body of the animal into sugar and gallic acid. But in the contents of the digestive organs, both in the larva and the beetle, he found no gallic acid; but, on the other hand, he states that he detected tannate or gallate of iron in the skin of the larva and in the elytra of the beetle intimately intermixed with the chitine, from which he supposes that their dark blue metallic color may be explained by the presence of this salt. The constituents enumerated by the author, calculated for 100 parts of the living beetles, are as follows:—

1. Water (moisture)	706.0
2. Constituents extracted by ether	86.0
3. Constituents extracted by alcohol	46.0
4. Constituents extracted by water	60.0
5. Constituents extracted by muriatic acid	32.0
6. Constituents extracted by potash	32.0
7. Skeleton (chitine)	36.0

The extract 2, consists of fatty oil, wax and chlorophyl, with traces of essential oil; 3, of yellowish-brown resin, osmazome, malate and muriate of potash, soda, lime and sugar; 4, of albumen, animal extractive matter, sugar, formiate, malate, phosphate, muriate, and sulphate of potash, soda, ammonia, lime and magnesia; 5, of gallate of iron, phosphate of lime, magnesia; 6, of humic acid, formed from animal fibre.—*Chem. Gaz., from Vierteljahrschrift für Prakt. Pharm.*

SIMPLE METHOD OF PREPARING THE PROTOXIDES OF IRON, MANGANESE AND TIN.

By PROF. LIEBIG.

Prof. A. Vogel's description of the preparation of his excellent polishing powder from protoxalate of iron has been an inducement to the investigation of some other oxalates, especially the protoxalates of manganese and tin, which, as I have found, may be obtained perfectly anhydrous.

Protoxalate of manganese is obtained, like the iron salt, by precipitating a protosalt of manganese with free oxalic acid; it is a white pulverulent precipitate, with a tinge of red. When heated to 212° – 248° F., it loses all its water; and when heated in this state in a common combustion-tube, it furnishes carbonic acid and carbonic oxide gases in exactly equal volumes, and leaves a pure protoxide of manganese of a pale green color, which, when touched with a red-hot body, ignites and smoulders into protoperoxide of manganese.

Protoxalate of tin behaves in exactly the same manner, and these two preparations may be employed in the formation of pure protoxide of manganese or tin as a class experiment. The decomposition of protoxalate of iron described by Vogel, furnishes a protoxide of iron, which is not quite free from metallic iron, but which is at any rate the purest that can be prepared in an anhydrous state; it ignites spontaneously in the air, and burns like a pyrophorus to oxide of iron. Protoxalate of iron contains in 1 atom ($C^4 O^6$, $2 FeO$) exactly 4 equivs. of water, as found by Vogel; when heated nearly to its point of decomposition, it loses another atom of water; and the great hardness of the oxide of iron obtained from it by slow combustion in the air depends evidently upon the dry combustion of the protoxide of iron.

I. 3.067 grms. of protoxalate of manganese, dried at 212° F., gave 1.642 grm. of protoperoxide = 50.02 per cent. of protoxide = $(C^2 O^3, MnO)$.

II. 3.941 grms. of protoxalate of iron, dried at 302° – 320° F., left after calcination 1.857 grm. oxide of iron = 42.4 per cent. of protoxide of iron; the formula $C^4 O^6, FeO + 3Aq$ requires 42.11 per cent.

4.336 grms. of the same salt furnished 0.656 grm. of water = 15.03 per cent. (formula 15.78 per cent.)

Protoxalate of iron decomposed by itself in a tube, furnished on the average of four experiments 56 vols. of carbonic oxide, and 68 vols. of carbonic acid, instead of equal volumes.—*Chem. Gaz.* Sept. 1855, from Liebig's *Annalen*, July 1855.

ON THE OCCURRENCE OF ASPARAGINE IN THE ROOT OF THE ROSE ACACIA (ROBINIA PSEUDACACIA).

By PROF. H. HLASIWETZ.

When extracted with water, the root of *Robini Pseudacacia* furnishes a decoction, in which, when it is evaporated to the consistence of a thin syrup, a considerable quantity of hard, rather large octahedral crystals are formed after a few days' standing. These, after being twice recrystallized, are perfectly colorless and strongly refractive; they do not effloresce, grate between the teeth, and have a slightly sweet mawkish taste. Their solution has a neutral reaction, and evolves ammonia when heated with solution of potash; it is not precipitated by acetate of silver or lead, but basic acetate of lead and protonitrate of mercury furnish white precipitates. When heated, the crystals fuse, the mass afterwards becomes brown, swells up, and evolves an unpleasant ammoniacal odour. Finally, they burn without residue. Sulphuric and nitric acids dissolve them without change.

This body is asparagine, as proved by the following analysis:

C	.	.	36.32	8 = 48	36.36
H	.	.	6.21	8 8	6.06
N	.	.		2 28	21.21
O	.	.		6 48	36.37

Asparagine appears to occur very commonly in the family of the Leguminosæ, as it has also been found in peas, beans, vetches, liquorice, &c.

The finest preparation is obtained from this root by mere decoction, evaporation, and recrystallizing twice. About 30 lbs. of fresh root furnished more than 2½ oz. of pure substance. This root is therefore to be particularly recommended for the preparation of asparagine.—*Chem. Gaz.* Aug. 15, 1855, from *Sitzungsber. der Akad. der Wiss. zu Wien, Math. Naturw. Classe.*

CHINESE METHOD OF SCENTING TEA.*

A few years ago, I sent you an account of the Chinese method of dyeing teas with Prussian blue and gypsum, to suit our depraved tastes in England and America. I shall now endeavor to describe a much more agreeable and rational manufacture—namely, that of scenting teas. That it is so in the eyes of the Chinese, may be gathered from the fact, that while they *dye* their teas, not to drink, but only to sell, they consume and appreciate highly these scented teas. The following account of this interesting process is copied from my journal:—

“I have been making inquiries for some time past, about the curious process of scenting teas for the foreign markets; but the answers I received to my questions were so unsatisfactory, that I gave up all hopes of understanding the business, until I had an opportunity of seeing and judging for myself. During a late visit to Canton, I was informed the process might be seen in full operation in a tea factory on the island of Honan. Messrs. Walkinshaw and Thorburn, two gentlemen well acquainted with the various kinds of teas sent annually to Europe and America, consented to accompany me to this factory, and we took with us the Chinese merchant to whom the place belonged. I was thus placed in a most favorable position for obtaining a correct knowledge of this curious subject. When we entered the tea factory, a strange scene was presented to our view. The place was crowded with women and children, all busily engaged in picking the stalks and yellow or brown leaves out of the black tea. For this labor each was paid at the rate of six cash a catty, and earned on an average about sixty cash a day—a sum equal to about three pence of our money. The scene altogether was not unlike that in the great Government cigar manufactory at Manilla. Men were employed giving out the tea in its rough state, and in receiving it again when picked. With each portion of tea, a wooden ticket was also given, which ticket had to be returned along with the tea. In the northern tea countries, the leaves are carefully weighed when they are given out and when they are brought back, in order to check speculation, which is

* *Athenæum*, July 21, 1855.

not unfrequent. I did not observe this precaution taken at Canton. Besides the men who were thus employed, there were many others busily at work, passing the tea through various sized sieves, in order to get out the *caper*, and to separate the various kinds. This was also partly done by a winnowing machine, similar in construction to that used by our farmers in England. Having taken a passing glance at all these objects on entering the building, I next directed my attention to the scenting process, which had been the main object of my visit, and which I shall now endeavor to describe.

“In a corner of the building there lay a large heap of orange flowers, which filled the air with the most delicious perfume. A man was engaged in sifting them, to get out the stamens and other smaller portions of the flower. This process was necessary, in order that the flowers might be easily sifted out of the tea after the scenting had been accomplished. The orange flowers being fully expanded, the large petals were easily separated from the stamens and smaller ones. In 100 parts 70 per cent. were used and thirty thrown away. When the orange is used, its flowers must be fully expanded, in order to bring out the scent; but flowers of *jasmin* may be used in the bud, as they will expand and emit their fragrance during the time they are mixed with the tea. When the flowers had been sifted over in the manner described, they were ready for use. In the mean time the tea to be scented, had been carefully manipulated, and appeared perfectly dried and finished. At this stage of the process, it is worthy of observing, that while the tea was perfectly *dry* the orange flowers were *just as they had been gathered from the trees*. Large quantities of the tea were now mixed up with the flowers, in the proportion of 40 lbs. of flowers to 100 lbs. of tea. This *dry* tea and the *undried* flowers were allowed to lie mixed together for the space of twenty-four hours. At the end of this time, the flowers were sifted out of the tea, and by the repeated sifting and winnowing process, which the tea had afterwards to undergo, they were nearly all got rid of. Sometimes a few stray ones are left in the tea, and may be detected even after it arrives in England. A small portion of tea adheres to the moist flowers when they are sifted out, and this is generally given away to the poor, who pick it out with the hand.

"The flowers, at this part of the process, had impregnated the leaves with a large portion of their peculiar odor, but they had also left behind them a certain portion of moisture, which it was necessary to expel. This was done by placing the tea once more over slow charcoal fires in baskets and sieves prepared for the purpose of drying. The scent communicated by the flowers is very slight for some time, but like the fragrance peculiar to the tea-leaf itself, comes out after being packed for a week or two. Sometimes this scenting process is repeated when the odor is not considered sufficiently strong; and the head man in the factory informed me he sometimes scented twice with orange flowers, and once with the 'Mo-le'—*Jasminum Sambac*.

"The flowers of various plants are used in scenting by the Chinese, some of which are considered better than others, and some can be had at seasons when others are not procurable. I considered it of some importance to the elucidation of this subject to find out, not only the Chinese names of these various plants, but also by examining the plants themselves, to be able to give each the name by which it is known to scientific men in all parts of the world. The following list was prepared with great care, and may be fully relied upon. The numbers prefixed express the relative value in the eyes of the Chinese, and the asterisks point out those which are mostly used for scenting teas for the foreign markets:—

1. Rose, scented (Tsing moi-qui hwa).
- 1 or 2. Plum, double (Moi hwa).
- 2*. *Jasminum Sambac* (Mo-le hwa).
- 2 or 3*. *Jasminum paniculatum* (Sieu-hing-hwa).
- 4*. *Aglaiia odorata* (Lan-hwa, or Yu-chu-lan).
5. *Olea fragrans* (Kwei hwa).
- 6*. Orange (Chang hwa).
- 7*. *Gardenia florida* (Pak-sema hwa).

It has been frequently stated that the *Chloranthus* is largely used. This appears to be a mistake, originating, no doubt, in the similarity of its Chinese name to that of *Aglaiia odorata*. The *Chloranthus* is called 'Chu-lan;' the *Aglaiia* 'Lan' or 'Yu-chu-lan.'

"The different flowers which I have just named are not all used in the same proportions. Thus, of orange flowers there are

40 lbs. to 100 lbs. of tea ; of *Aglaia* there are 100 lbs. to 100 lbs. ; and of *Jasminum Sambac* there are 50 lbs. to 100 lbs. The flowers of the Sieu-hing (*Jasminum paniculatum*) are generally mixed with those of the Mo-le (*Jasminum Sambac*) in the proportion of 10 lbs. of the former to 30 lbs. of the latter, and the 40 lbs. thus produced, are sufficient for 100 lbs. of tea. The 'Qui-hwa' (*Olea fragrans*) is used chiefly in the northern districts as a scent for a rare and expensive kind of Hyson Pekoe,—a tea which forms a most delicious and refreshing beverage when taken *à la Chinoise*, without sugar and milk. The quantity of flowers used seemed to me to be very large ; and I made particular inquiries as to whether the teas that are scented were mixed up with large quantities of unscented kinds. The Chinese unhesitatingly affirmed that such was not the case, but notwithstanding their assertions, I confess I have some doubt on this point.

"The length of time which teas thus scented retain the scent is most remarkable. It varies, however, with the different sorts. Thus, the *Olea fragrans* tea will only keep well for one year ; at the end of two years it has either become scentless, or has a peculiar oily odor, which is disagreeable. Teas scented with Orange blossoms and with those of the Mo-le, will keep well for two or three years, and the Sieu-hing kinds for three or four years. The *Aglaia* retains the scent longer than any, and is said to preserve well for five or six years. The tea scented with the Sieu-hing is said to be most esteemed by foreigners, although it is put down as second or third rate by the Chinese.

"Scented teas for the foreign markets are nearly all made in Canton, and are known to merchants by the names of 'Scented Orange Pekoe,' and 'Scented Caper.' They are grown in and near a place called Tai-shan, in the Canton Province. Mr. Walkinshaw informs me that other descriptions of tea, both black and green, have been scented for the English market, but have been found unsuitable. True 'caper' is to black tea what the kinds called 'imperial' and 'gunpowder' are to green : it assumes a round, shot-looking form during the process of manipulation, and it is easily separated from the other leaves by sifting or by the winnowing machine. It is a common error to suppose that 'imperial' or 'gunpowder' amongst green teas, or 'caper' amongst black ones, is prepared by rolling each leaf singly by the hand.

Such a method of manipulation would make them much more expensive than they are. One gathering of tea is said to yield seventy per cent. of orange pekoe, twenty-five of souchong, and five of caper. The quantity of true caper would therefore appear to be very small; but there are many ways of increasing the quantity by peculiar modes of manipulation.

"In a large factory, such as this at Canton, there is, of course, a considerable quantity of dust and refuse tea remaining after the orange pekoe, caper, and souchong have been sifted out of it. This is sold in the country to the natives at a low price, and no doubt is often made up with paste and other ingredients into those *lie teas* which now-a-days find a market in England. Nothing is lost or thrown away in China. The stalks and yellow leaves which have been picked out by women and children, are sold in the country; while the flowers which have done their duty in the scenting process are given to the poor, who pick out the few remaining tea leaves which had been left by the sieve or winnowing machine. Some flowers, such as those of the *Aglaia* for example, after being sifted out from the tea, are dried, and used in the manufacture of the fragrant 'jos stick,' so much used in the religious ceremonies of the country.

"It appears from these investigations that many kinds of fragrant flowers, besides those used by the Chinese, would answer the purpose equally well, and, therefore, in places like India, where tea is likely to be produced upon an extensive scale, experiments in scenting might be made with any kinds of jasmynes, daphnes, aurantiaceous or other fragrant plants indigenous to the country.

R. F."

Shanghai, May 2d.

CONTRIBUTIONS TO TOXICOLOGY.

Translated from "Archiv. d. Pharmacie, March, 1855," and "Buchner's News Repertorium, 1855."

By J. M. MAISCH.

On the value of Albumen and Hydrate of Magnesia as Antidotes for Corrosive Sublimate.

The fact that albumen is not a reliable antidote for corrosive sublimate, has induced many to look for another better one, and

such a one was thought to be calcined magnesia. The importance of the matter and the certainty with which the efficiency of magnesia in cases of poisoning with corrosive sublimate was spoken of, induced Dr. L. Schrader, of Goettingen, to make a series of experiments, the results of which are as follows:—

1. Albumen is not a sure antidote to corrosive sublimate. The combination of both is not only soluble in an excess of albumen, but also in the albuminous liquids of the stomach and intestines, and especially in the acids of these organs.

2. Albumen is only useful when mixed with water; it is taken in so large quantities as to cause vomiting, which may also be produced by tickling the throat.

3. Hydrate of magnesia can not be regarded as an antidote, as it does not enter into a harmless combination with corrosive sublimate, but produces red oxide of mercury, which of itself is a very poisonous substance. (*Deutsche Klinik*, 1854.)

On Powder of Nux Vomica, by Norbert Gille.

A druggist in Bruxelles sold pulv. nuc. vomic., which, instead of being gray, had a yellow color and a greater specific gravity than the former. On inquiring, it was ascertained that previous to pulverizing, the nux vomica had been dried in a stove.

It was thought that, at least, partly, the alkaloids and lactic acid must have been altered. To ascertain this, 200 grm. of nux vom. was divided into two parts, one of which was heated in the sand bath and the temperature increased until the color was changed to that suspicious yellow; the nux vomica became softer and sent forth alkaline vapors even under 100° C. On extracting the alkaloids, it gave much less of them than the other portion, which had not been exposed to the action of heat. (*Journ. de Pharm. d'Anvers*, 1854.)

Iodine against poisoning with Belladonna.

Suiz Rioya, in "Revue de Thérapeutique Med. Chirurg. 1854, Fevr.," relates a case of poisoning with about 2 drachms of ext. belladon. which was taken by mistake; the case was cured by a solution of 1 grm. iodide of potassium and 20 centigram iodine in 750 grm. distilled water; 120 grm. being given half-hourly.

Suiz Rioya mentions this as a proof of the curative powers of iodine, even when the symptoms of poisoning with belladonna are of longer duration; a fact to which Bouchardat has first drawn attention, recommending iodine in such cases as an antidote. (*Buchner's N. Repert. III.*)

Tannin, the best Antidote against Poisonous Fungi.

Dr. Chausarel, of Bordeaux, proves, by a series of experiments, that tannin is the best antidote against poisonous fungæ, and recommends in such cases, if not too much time has elapsed, first, an emetic, to be followed by a decoction of galls, or, if not convenient, of Peruvian, oak or pine bark, a small glassful to be given every five minutes; or, better still, a solution of 30 to 40 grs. tannin in a bottle ($1\frac{1}{2}$ pts.) of water. He entirely rejects vinegar, which has been so much recommended. (*Journ. Méd. de Bord.*)

Chemico-legal detection of Copper.

A. Georges, by a number of experiments, has tried to answer the question, whether and in what manner, copper may be discovered; if arsenic was not found in the carbonaceous residue left after the treatment of organic substances with sulphuric acid, as has been proposed by Danger and Flandin for the detection of arsenic.

The results of the experiments are as follows:

1. The residue of the treatment of animal substances with sulphuric acid does not impart any copper to distilled water, and may, therefore, afterwards, be used for the extraction of this metal.

2. Nitric and muriatic acids dissolve a perceptible quantity of copper, which, however, is very small, compared with that remaining undissolved; the simple charring, therefore, must be rejected.

3. Incineration is likewise insufficient, as a volatilization of some copper is always unavoidable.

4. This loss of copper is occasioned by the presence of chlorine in the animal body.

5. Incineration, with previous charring by acids, is not productive of that error, and allows the extraction of all the copper. (*Journ. de Chim. Méd.*)

Poisonous properties of the common Yew-tree.

Dujardin, veterinary surgeon of Bayeux, has observed some cases of poisoning by *Taxus baccata*; horses, sheep, cows, asses and other animals died several hours after they had eaten of the leaves. The poisonous properties, however, were known to the ancients. According to Plutarch, its smoke killed the cats. Strabo says that the Gauls poisoned their lance points with its juice. Theophrastus declares the leaves poisonous for horses, but not for cattle. Plinius relates, that wine which had been put in barrels made of its wood, occasioned the death of those who drank of it. Dioscorides says, its berries are poison to birds. Other authors speak of the dying of fishes, in water into which its roots had been thrown. (*Journ. de Chim. Méd.*)

*Hydrocyanic Acid in a corpse, three weeks after death;
by Brame.*

A young man, of Tours, poisoned himself with medicinal hydrocyanic acid of 1-12th strength, of which he took about 25 grm. Three weeks after his interment, I was called to try to find the poison in the corpse. I succeeded in recognizing it, and ascertaining the quantity of what had remained in the stomach. Nitrate of silver produced a yellowish precipitate, which, after washing and drying in vacuo, assumed a grayish color; it was soluble in ammonia and cyanuret of potassium. By decomposition with potassium, cyanuret of potassium was obtained, of which cyanic acid and Prussian blue could be easily prepared. Suspended in water, hydrosulphuric acid decomposed it, leaving, after separating the sulphuret of silver, a clear solution of hydrocyanic acid; which could also be obtained by decomposition with hydrochloric acid, the vapors of the resulting solution producing a white precipitate in nitrate of silver, soluble in ammonia. The original precipitate, on heating, generated cyanogen and a little water; on heating with caustic potassa no ammonia was evolved.

Three weeks after interment, the hydrocyanic acid still remained in the stomach, apparently without having entered into a chemical composition. I was able to collect yet about 0.60 grm. of cyanuret of silver, corresponding with 0.12 grm. hydrocyanic acid. (*Gaz. Méd. de Paris*, 1855, No. 47.)

On the various antidotes for Copper.

By Dr. L. SCHREADER.

The results of his critical experiments may be expressed by the following :

1. *Hydrated magnesia* and the carbonates of the alkalies are no antidotes to copper, inasmuch as the hydrated oxide of copper is again dissolved by the acids of the stomach and entrails. Magnesia, therefore, may retard the acute course of poisoning, but cannot entirely arrest it.

2. *Hydrated sulphuret of iron* decomposes the salts of copper instantaneously, and sulphuret of copper is insoluble in the digestive organs ; but whether the mono-sulphuret of iron could act dangerously by the generation of hydro-sulphuric acid, is to be settled first by further experiments. Larger quantities of it might, at least, molest the stomach and bowels by its volume and state of aggregation.

3. The reduction of the oxide of copper by *sugar*, under the aid of the temperature of the human body, progresses too slowly to be of much value in acute cases of poisoning by copper ; sugar may be serviceable, when freely used as sugar-water, by its promoting and even effecting vomiting.

4. If a pharmaceutical remedy is to be applied, *ferrocyanuret of potassium* might best be recommended, because large doses of it do but little harm ; it decomposes the salts of copper immediately ; and the resulting ferrocyanuret of copper, on account of its almost insolubility, has hardly any poisonous effect.

5. *Albumen and milk* have the advantage not to hurt when taken in excess, and to neutralize the poisonous salt of copper ; but this treatment can only be successful, if care is taken to remove, as quick as possible, the newly formed albuminate or caseate of copper from the stomach and bowels. (*Deutsche Klinik*, 1855, No. 4.)

Sulphite of Soda, as an antidote against Mercury.

Dr. Astrié has been endeavoring to discover a remedy, which not only would heal the symptoms occasioned by the abuse of mercury, but which would also allow of a continuance of the mercury, without a recurrence of those mercurial symptoms. This peculiar

effect is produced by the sulphuretted mineral waters ; and considering that sulphur, in the channels of digestion, forms sulphurets (?), which act as diaphoretics and alteratives, developing their action on the albuminous substances ; that the sulphurets, by the influence of carbonic acid in the mesenteric blood, form a little sulphuretted hydrogen ; that they pass through the liver, oxydizing and forming sulphites, hyposulphites and sulphates ; from all this he inferred that these last products, and not the sulphurets, must be used, because they are found in the animal excretions, when a somewhat considerable quantity of sulphur has been taken.

If a solution of corrosive sublimate is poured into the white of eggs, until a thick precipitate is formed, a few drops of a solution of sulphite or hyposulphite of soda suffice to restore the transparency of the liquid. The same will be observed, if blood-serum, containing some cruor, is substituted for albumen. The sulphite of soda, however, effects a solution quicker and more perfect.

Mialhe asserts, that all preparations of mercury by a reaction with the chlorides form corrosive sublimate ; then the immense importance of the fact of the solution of the albuminate of mercury by sulphite of soda, is at once obvious. The albuminate of mercury which retains the mercury in the body, according to the above, can be dissolved and excreted by the preparations of sulphur.

Sulphite of soda excels all others for its dissolving effect. It may be commenced with eight grs., the dose seldom exceeding a drachm in twenty-four hours. It is very refreshing, with an after-taste somewhat like roasted hazel nuts, and has not the local irritating properties of the sulphurets. It is soluble in four parts of cold water, and may be given in sweetened water or lemon syrup. It agrees well with the stomach and acts diuretic. (*Gaz. Med. Ital. Lombard.* 1854, Aug.)

Lac Magnesiae as an antidote to Phosphorus, by X. Lanierer.

A girl ate about a tablespoonful of the well-known phosphorus paste, mistaking it for rice-pap ; the white vapors arising from the mouth soon made the calamity known, and I was applied to for help. I gave her freely lac magnesiae, (magnesia usta stirred

in sugar-water,) which was taken by the child without resistance. The burning sensation in the stomach and the colic soon subsided, and the presence of phosphorus was detected in the stools by their white vapors and their lumination in the dark. After eight hours the child was out of danger. (*Buchner's Neues Repert.* 1855.)

POISONING BY COLCHICUM—TEST FOR COLCHICIN.

By DR. CASPER.

[Translated and abridged by J. M. MAISCH.]

In Casper's *Vierteljahrsschrift*, III. part 3, the poisoning of four men is related, a case of the greatest interest to physicians and chemists, as cases of poisoning by colchicum are of very rare occurrence, and the reactions of its alkaloid, colchicin, are barely known; but few chemists, in fact, having ever seen it.

On the 20th of February, last year, the victims took from the room of a physician, in Berlin, Prussia, a demijohn containing a brown liquid, which, from the taste and smell, they supposed to be some stomachic bitters, and partook of it, each one about a wineglass full. A girl, who took a little of it, was taken with vomiting and diarrhoea, but recovered. About the illness of the men, Dr. Casper regrets not to have more authentic accounts, owing to their not being supposed to be poisoned, physicians were not called in until very late. The symptoms previous to death seem to have been nausea, purging and vomiting, pains in the stomach, coldness of the extremities, face very pale, lips little red, tongue in normal condition, *no* delirium, motility and sensibility as usual, pupils not dilated, headache, restlessness, no appetite, much thirst, death under symptoms of prostration,

The post mortem examinations were held on the 23d, in the presence of a large number of physicians and students, attracted by the novelty of these cases.

The examination showed, as common to all four individuals:

1. *Not* a rapid mortification, as is very often stated in medical books to be the case in death from the effects of colchicum.
2. Acid reaction of urine and the liquids of the stomach.
3. Blood thick and of a dark cherry color.
4. Aorta hyperemically filled.
5. Kidneys containing much blood.
6. Bladder more

or less filled with urine. 7. Liver healthy, no accumulation of blood. 8. The right heart overfilled with blood. 9. Lungs about normal, not too much blood. 10. Large brains remarkably much blood.

A chemico-legal examination was required of

1. The stomachs, &c., of all four individuals.
2. The contents of the same.
3. The vomited liquid.
4. The stool of one.
5. The balance of the poisonous liquid.

This last was, according to color, smell, taste and spec. gravity recognized as tincture sem. colch. To admit of no doubt, colchicin was to be prepared from it. The tincture was evaporated to syrup, the residue extracted by absolute alcohol, with a little tartaric acid, filtered, evaporated, a little water added, to separate oil, saturated with bicarbonate of soda, four times its quantity of ether and some caustic soda added to the filtered liquid, and after shaking for some time, the ether was allowed to evaporate spontaneously, when a little yellowish residue was left, corresponding in its reactions with a sample of colchicin, obtained from Mr. Mueller, in Breslau, who had prepared it himself, and stated that he obtained 5 grs. of alkaloid from 1 lb. of sem. colch.; it was easily soluble in water and alcohol, less in ether; taste bitter, acrid, not burning; the aqueous solution occasioning a voluminous white precipitate, with tannin, soluble in alcohol, a kermes-brown with tincture of iodine, and a yellow precipitate with chloride of platinum; concentrated nitric acid dissolved the substance with a violet color, concentrated sulph. acid produced a dark yellow color, changing to a dirty green.

The identity of the liquid (No. 5.) with the official *tinctura seminis colchici* being established beyond a doubt, the contents of the stomach were next subjected to analysis. After proving the absence of injurious metallic substances, they were mixed with absolute alcohol, strained and evaporated at a low heat to a syrup, extracted with absolute alcohol and tartaric acid, and proceeded as above. The residue, after the evaporation of the ether, showed all the reactions of colchicin.

No trace of colchicin could be detected in the vomited liquid (No. 3.) and an analysis of the stool was therefore not deemed

necessary. The report of this chemical examination is by Mr. Schacht; at the same time on the investigation of H. Rose, an analysis was made by Dr. Wittstack.

The best result to attain colchicin was in the following: $\frac{1}{2}$ oz. tinct. sem. colch. with 4 drops acetum concent. was evaporated at 80° R. (100° F.) dissolved in $\frac{1}{2}$ oz. aq. destill., separated from the oil, added 10 grs. magnes. usta, well shaken; after several hours 2 oz. of ether was added, well shaken, the ethereal liquid evaporated spontaneously, the residue taken up with water, some fat separated, filtered and in a watch crystal evaporated, when by its reaction it was proven to be colchicin, with a little fatty acid adhering to or combined with it.

The contents of the stomach were mixed with large quantities of alcohol, mixed with a few drops of muriatic acid, filtered, evaporated at 100° F. to a thin syrup, dissolved in distilled water separated from the fat, carefully evaporated and alcohol added until a precipitate ceased to appear; then evaporated, dissolved in distilled water, filtered, evaporated to about 1 oz., $\frac{1}{2}$ dr. magnes. usta added, and afterwards 3 oz. ether. This was filtered, evaporated spontaneously, dissolved in water, separated from the fat, and then evaporated in a watch crystal, when the residue showed properties and reactions of colchicin.

According to the above, the author thinks it will henceforth be possible to discover and prove poisoning by colchicum, which is very important, as by the above most careful examinations it is doubtless that colchicin, the alkaloid of colchicum, is one of the most deadly poisons. Worthy of notice are the following expressions of Mr. Schacht in this regard:—

“It is remarkable how small a quantity colchicin has a deadly effect on the human being. Each of the four victims is said to have taken about a wine glassful of the officinal tinct. sem. colchici. Suppose the demijohn to have been full, each one could not have taken over four ounces, which are equal to 1 oz. of the seed. Mr. Mueller obtained from 16 oz. of seed 5 grs. colchicin. This may be less than the real amount of alkaloid, but on the other hand, the lawful recipe for the preparation of this tincture is not for the complete exhaustion of the seed. Accordingly, each one had taken to the utmost $\frac{2}{5}$ or $\frac{1}{4}$ grain of colchicin at once, and such a dose was sufficient to cause death in a short time.”—*Archiv. d. Pharm.* 1855, 1–24.

ON THE EXTRACTION OF CAOUTCHOUC.

By M. WEDDELL.

Caoutchouc may be obtained from a great many plants, but those which yield it in any abundance, are comparatively few in number. They belong to the natural orders Artocarpæ, Apocynaceæ, and Euphorbiaceæ, and inhabit all the warmest parts of the earth.

In *Artocarpæ* we have,

Castillea elastica (Cerv.) of Mexico,

Cecropia peltata (Linn.) of Tropical America,

And various fig-trees of Asia and America, of which, however, *Ficus elastica* is the only important one, being the principal source of caoutchouc in the East Indies.

In *Apocynaceæ* there is,

Urceola elastica (Roxb.) which furnishes the Borneo and Sumatra India-rubber, known in commerce as Singapore or Pulo-Penang India-rubber.

Vahea gummifera (Poir.), the source of Madagascar India-rubber; and *Hancomia spinosa* (Gomez.), from which I saw a large quantity collected in the interior of the Brazils.

Belonging to *Euphorbiaceæ* we have the well-known *Siphonia elastica*, or *Hevea guyanensis*, which yields the largest amount of commercial caoutchouc, known in commerce as Para Indian-rubber, from its being imported from Para, a small port situated at the mouth of the Amazon river.

This tree, which grows extensively on the plains of the Oronoco and Amazon rivers, will be one to which my remarks will be exclusively confined. *Siphonia elastica*, or the Syringe-tree* of

* The origin of this name is given in *L'Histoire de l'Académie Royale des Sciences*, 1751, page 18, in the following terms:—

“The Omaquas, a tribe inhabiting the borders of the Amazon river, make an extraordinary use of this exudation. They form it into pear-shaped bottles or bulbs, in the neck of which they fasten a hollow wooden tube; upon filling the bulb with water, and then pressing it with the hand, the water is forced out at the mouth of the tube, forming, in this way, a complete syringe. It is considered by these people an ordinary mark of politeness for a host to present to each of his guests one of these bottles filled with warm water, and which they do not fail to make use of before dinner. This strange custom has led the Portuguese to name the tree which produces this resin, *Pas de ziringa*, or syringe wood.”

the Brazils, generally averages sixty-five to sixty-seven feet in height, frequently reaching forty to fifty feet before a single branch is given off. The diameter varies from thirty to forty inches.

These dimensions, however, are frequently met with in trees which inhabit the tropical forests, but the peculiarity of its foliage, each leaf being composed of three elongated leaflets, together with the abundance of milky juice it yields upon incision, easily distinguishes this tree from all others growing around it.

Nothing could be easier than the method of collecting and preparing caoutchouc. The workman goes early in the morning into the forest, provided with a hatchet, a calabash, and a quantity of soft clay. Arriving at the foot of a *Siphonia*, he fastens round its base, by means of the clay, a small glazed dish, resembling in shape a swallow's nest, and with his hatchet severs the bark immediately above the dish. The milky sap immediately exudes, and is collected in the dish below. When a sufficient number of trees have been treated in this way, the workman collects the contents of the little dishes in his calabash and returns home with his booty.

The quantity of sap yielded by one tree naturally varies, but on an average, twenty trees yield two pints; and, when well managed, the same trees will yield daily the same quantity during a period of some months.

A traveller tells me, that being on the borders of the Amazon river, he stopped a day in the cottage of a caoutchouc collector, and about mid-day he saw his host returning with a calabash, which contained eight pints of *siphonia* milk, a quantity sufficient for the manufacture of ten pairs of shoes. His daughters, who were less practiced than himself, had during the period collected four pints, which is the average quantity for one workman. I have mentioned shoes, because in that form, or as round and egg-shaped bottles, tubes, and sheets, the larger quantity of India-rubber is still exported from the Brazils. The bottles are made by dipping a ball of clay, fastened to the end of a stick, into the fresh juice, and immediately afterwards holding it in a thick smoke, produced by the combustion of oleaginous seeds. When the first layer has partially solidified, others are applied in the same manner, till a sufficient thickness has been obtained.

Shoes are made in the same manner, with the exception that a wooden mould, thinly coated with clay, is employed—as it admits of being withdrawn without breaking. Ten minutes is generally sufficient for a clever workman to make a pair of shoes. I must mention, however, that the effect of the smoke is to coagulate the caoutchouc. The hardening is afterwards effected by exposure for some time to the sun.

Some experiments have recently been made with a view to the exportation of this substance in the liquid state, by inclosing it in hermetically sealed bottles. Upon opening these bottles, however, a solid mass of caoutchouc floating in a serous liquid, presents itself. If the milky sap, as at first extracted, be allowed to stand for some time, it separates into two portions in the same manner as milk; a substance which it closely resembles in appearance and taste. It may also be drank without any injurious effects being produced.

The most favorable period for extracting caoutchouc is the summer season, from April to November. During the wet weather the work in the forest is very difficult and unhealthy. The product also is very inferior, containing much less of its solid coagulable constituents. During the collecting season the trees have to be wounded afresh every day; it therefore becomes necessary to make the first incisions as low down as possible, because also, the old wounds in healing frequently form a sort of swelling round the part which would absorb a portion of the descending sap.

The quality of these trees varies greatly, some yielding more than others; generally, however, the more sap there has been abstracted, the more the tree seems capable of yielding. In this respect these trees resemble good cows.

The preceding facts will be sufficient to prove that the method adopted by the Africans, Indians, and South Americans for obtaining caoutchouc, is at once simple and efficacious. Every fact in the history of this substance is calculated to stimulate the activity of an intelligent explorer, and assures us of the future prosperity of one of the most interesting branches of American commerce.—*London Pharm. Journ. Sept. 1855.*

NOTE ON THE INDIA-RUBBER OF THE AMAZON.

By R. SPRUCE, Esq.*

The extraction of caoutchouc from the various species of *Siphonia* was, at the time of my arrival in Pará (July, 1849), a branch of industry limited to the immediate environs of that city, being carried on principally in the island of Marajó, and about the mouth of the Tocantins. The low price it fetched in the Pará market (10 milreis—£1 3s 4d the *arroba* of 32lbs.), and the great gains which those who trade in the *sertao*† except on their outlay, prevented the *sertanejos* from employing themselves in the fabrication of *seringa*;‡ to which contributed also the universal apathy and even antipathy to everything new, if it involved labor, no matter how profitable. When I ascended the Rio Negro in 1851, I pointed out to the inhabitants the abundance of *seringa*-trees they possessed in their forests, and tried to induce them to set about extracting the gum; but they shook their heads, and said it would never answer. At length the demand for India-rubber, especially from the United States, began to exceed the supply; the price consequently rose rapidly, until early in 1854 it reached the extravagant sum of 88 milreis (£4 8s. 8d.) the *arroba*. This woke up the people from their apathy, and the impulse, once given, extended so rapidly and widely, that nearly throughout the Amazon and its principal tributaries, the mass of the population put itself into motion to search out and fabricate *seringa*. In the province of Pará alone (which now includes a very small portion of the Amazon) it was computed that 25,000 persons were employed in that branch of industry in the year

* *Hooker's Journal of Botany and Kew Gardens Miscellany*, July, 1854, p. 193.

† The Interior,—literally, "the desert."

‡ The name usually given to India-rubber on the Amazon is "Xeringue (pronounced nearly *Sheringhy*). This is undoubtedly an Indian corruption of the Portuguese word "*Seringa*," a syringe or clyster-pipe, the fabrication of which was the first use to which the gum of the *Siphonia* was applied in its native country. In *Lingoa Geral*, *xeringue* is the common term for a liar (query, a *stretcher*?), but, as it has no affinity with any other word in the same language, it seems certain that it is of Portuguese origin. The Spaniards have adopted the term "*Seringa*," in which I follow them. The Indians of Venezuela call the rubber *yápi dâpi*, or *dâpiche*.

1854. Mechanics threw aside their tools, sugar-makers deserted their *engenhos*, and Indians their *rocas*; so that sugar, rum, and even *farinha*, were not produced in sufficient quantity for the consumption of the province, the two former articles having to be imported from Maranhão and Pernambuco, and the last from the river Uaupés.

The mode of obtaining the milk is almost universally by tapping. Some who began by cutting down the trees, found that in this way they obtained much less milk than by successive tapplings of the same tree, besides that the work was harder, and it was necessary continually to shift their sphere of operations. I am glad, therefore, that this killing of the tree to get at the golden eggs has been abandoned.

Most *seringueiros* follow the old mode by drying the milk by smoke, applied to successive coatings on a mould. Some have filled a small square box with the milk, and allowed it to coagulate; but, as the milk does not become solid until the end of ten days or more, and the mass then requires to be cut into thin slices, and subjected to heavy pressure (such as it is difficult to obtain here), in order to free it from the water and air collected in cells within its substance, this mode is by no means popular.

It is found that the addition of a small quantity of alum accelerates the coagulation of the milk. Ammonia has a contrary effect, and is accordingly useful when the milk is required to be kept some time in a liquid state.

When the trees are flowering, nearly all the milk goes to the nourishment of the flowers, and scarcely any can be obtained from the trunk, while if a panicle be wounded the milk starts out in large drops. It is customary to leave the trees untouched for a few months in the year, from the epoch of flowering until the fruit has attained its full size. About Pará, the collection of *seringa* seems limited to the dry season—June to December. On the upper Rio Negro, the *seringa*-trees flower from November to the end of January; and when I started from San Carlos on November 23d, little milk was to be obtained.

The species from which rubber is extracted on the upper Rio Negro and lower Casiquiare are two *Siphonia lutea*, Spruce (*Journ. of Bot.*, vi., 370), and *S. brevifolia*, Spruce (3139 to Benth.); known respectively as the *long-leaved* and *short-*

leaved seringa. The former yields most milk, but neither is so productive as the *seringa* of Pará (*Siphonia Brasiliensis*, Wild.). Both are straight, tall, and not very thick trees, with smoothish thin bark, and yellow very odoriferous flowers, while the other species have mostly purplish flowers. I suppose their average height may be about 100 feet. I cut down a tree of *S. brevifolia* near San Carlos which measured 110 feet. I first saw and gathered *S. lutea* in the mouth of the Uaupés; and as I came down the Rio Negro in December, 1854, I found a *ranch*o erected on the spot, and a person employed in extracting rubber from the same trees as I had taken the flowers.

Near the Barra, some milk is taken from a *Siphonia* common on the river-banks (*S. elastica*, Aubl. ?); but there is another species growing in the interior of the forest said to yield more milk. I have not seen it, and cannot say whether it is a species known to me.

The *Siphonia* most frequent about the mouths of the Tapajoz and Madeira seems to be *S. Spruceana*, Benth., but there are, no doubt, other species.

I have gathered, in all, some seven or eight species of *Siphonia* on the Amazon and Rio Negro, but it is probable that two or three times as many still remain to be discovered.

On the Uaupés, I met with two trees* of a genus apparently far removed from *Siphonia*,—possibly they are *Sapotaceæ*, for I did not analyse the flower (*Micrandra*, Benth. in *Journ. of Bot.*, vi., 371)—which yield pure rubber, and are also called by the Indians *Xeringue*; but the clustered trunks (often as many as ten from a root) and the simple (not ternate) leaves, give these trees an aspect very different from that of the *Siphoniæ*.

There are, doubtless, several other trees in the valley of the Amazon which yield rubber, but in many cases mixed with resin, which we have not here the means of separating. Such are a great many Figs and Artocarps, two families which abound towards the head-waters of the Rio Negro and Oronoco. On the Casiquiare, the Indians make white shirts of the bark of an epiphytal fig, which they call *marima blanca*, the milk of which is said to be very copious, and when dry elastic. Towards the

*No. 2427 and 2479 to Bentham.

upper mouth of the Casiquiare I saw several trees of *marima blanca*, but they were perched high up on other trees, and had no flowers or fruit. Those who have herborized among mosquitoes, ants, and wasps, will understand why I did not trouble myself to gather only a sterile branch.

In descending the Casiquiare, in January, 1858, I reached one evening a small village some distance above the outlet of Lake Vasiva—one of those *pueblos* which spring up on the banks of Rio Negro and Casiquiare, endure barely a generation, and then disappear—where I found nearly the whole population (Indians of the tribe Pacimonare) amusing themselves by a sort of football. Their balls seemed to be the inflated bladders of some large quadruped, such as the tapir; but on picking one up I found it to be India-rubber. I asked them to keep two or three balls for me when they had finished their game, and they promised to do so, but during the night they all got gloriously drunk and burst their balls. I did not see the tree from which this rubber was extracted, but from the description given me it was a true *Siphonia*, perhaps *S. lutea*.

In consequence of so many people devoting themselves to the fabrication of *seringa*, the value fell again more rapidly than it had risen, and by last advices from Pará to date of February 1, 1855, *seringa* was down at 15 to 18 milreis the arroba.

RICHARD SPRUCE.

Barra do Rio Negro, Feb. 9th, 1855.

Hooker's Journal of Botany and Pharm. Journ.

SPECIFICATION OF THE PATENT GRANTED TO JAMES A. CUTTING, OF BOSTON, IN THE UNITED STATES OF AMERICA, PHOTOGRAPHER, FOR AN IMPROVED PROCESS OF TAKING PHOTOGRAPHIC PICTURES ON GLASS, AND ALSO OF BEAUTIFYING AND PRESERVING THE SAME.—[Dated London, July 26, 1854.]

This invention consists in an improved process of taking photographic pictures upon glass, and also of beautifying and preserving the same, which process I have styled "ambrotype." My improved process has reference to the art of taking pictures photographically on a film of collodion upon the surface of a sheet of glass, the collodion being suitably prepared for the pur-

pose. By the use of the said process, the beauty and permanency of such pictures are greatly increased, and I have on this account styled the process "ambrotype," from the Greek word *ambrotos*, immortal.

The first part of my invention consists in the use of alcohol, for the purpose of depriving the gun-cotton, of which the collodion is made, of its moisture after it has been washed, to free it from the acids used in its manufacture.

It has been found that where gun-cotton has been exposed to the action of the atmosphere for the purpose of drying it, the sensitiveness of the collodion prepared from it is sensibly diminished. By the use of alcohol it may be deprived of its moisture after being washed, without exposure to the air, and without the consequent deterioration of its sensitiveness. This part of my process I conduct as follows:—So soon as the cotton has been sufficiently exposed to the acids and has been thoroughly washed, it is plunged into strong alcohol, which effectually deprives it of the water which it contains, without exposing it to the atmosphere for the purpose. From this alcohol it is taken immediately to the mixture in which it is dissolved for the purpose of forming the collodion. This mixture consists of ten parts of sulphuric ether and six of alcohol, or thereabouts. The collodion thus formed is allowed to remain until it has settled perfectly clear, which usually requires about twenty-four hours. It is then decanted, and to every pint is added eighty grains of iodide of potassium dissolved in alcohol. It is then well shaken, and thirty-two grains of refined gum camphor is added to each pint of the collodion, and after it has again settled it is fit for use. The object of the camphor is to increase the vigor and distinctiveness of delineation of the positive pictures, and particularly of the half tints. It also greatly increases the beauty of the picture, by giving a fineness of deposit not heretofore attained by any other means. The use of the gum camphor in the manner above described forms the second branch of my invention. The collodion is then applied to the surface of the glass in the following manner:—

The plate of glass being held horizontally, a portion of the collodion is poured upon it, and it is then inclined in different directions, so as to cause the collodion to flow over its whole sur-

face, upon which it forms a colorless transparent film; the excess of collodion is then allowed to run off, and the glass, being still held horizontally, is inclined to one side and the other, until the collodion becomes partially thickened or set. When this has taken place, and before it is dry, it is rinsed in a solution of crystallized nitrate of silver, of a strength of forty grains to the ounce of water; the film is thus impregnated with iodide of silver, and after remaining in this bath a sufficient length of time for the ether to escape from the collodion, the plate is ready to be placed in the camera. After being exposed a sufficient length of time in the camera, it is taken to a dark room, where the latent picture is developed, by the application of a solution of protosulphite of iron, acetic acid, and nitric acid, in about the following proportions:—One quart of soft water, one ounce protosulphite of iron, thirty-two drachms No. 8 acetic acid, one drachm nitric acid. These exact proportions are not rigid, but I have found them to be sufficient for the purpose of developing the picture. After this is accomplished it is washed in clean soft water, and then the remaining iodide of silver is dissolved from the collodion by a solution of hyposulphite of soda, after which the picture is entirely cleansed of the hyposulphite solution by washing as before, in soft water. The picture is then dried, either in the open air or by the aid of a gentle heat, and the process is completed.

To permanently improve the beauty of the pictures, and to deprive them of a bluish, hazy, indistinct look, is the object of my third improvement, which consists in the application of a coating of balsam of fir to the surface of the glass upon which the picture is made, the balsam being confined to the picture plate by a secondary plate of glass, which is applied to the picture plate in a manner which will now be described, and which hermetically seals up the picture and protects it from every and any injury not sufficient to fracture the glasses themselves. This part of the process will now be described.

A second plate of glass is prepared of the same size as that which carries the picture, and is thoroughly cleansed; the picture plate is then held horizontally, the picture side uppermost. The balsam is then applied in a line along one edge of the glass, and one edge of the secondary plate is then applied to the edge of the first, which contains the balsam. The two plates are then

pressed gradually together, by which the balsam is caused to flow entirely across the picture towards the opposite edge, and the air is effectually excluded from between the plates. The superabundant balsam is then removed by pressing the glasses together, and a thin coating of it only is left upon the surface of the picture. The beauty and distinctness of the pictures are greatly enhanced by the application, the finer lines as well as the dark portions and shadows being rendered far more distinct, and the most minute delineations being brought out and made visible, while the application of the second plate of glass secures the whole from the action of air, moisture, and dust.

What I claim as my invention, is,

1st. The method of depriving the gun-cotton of its moisture by the use of alcohol, whereby the sensitiveness of the collodion prepared therefrom is preserved unimpaired.

2d. The use of gum camphor in the preparation of collodion for the purpose set forth.

3d. I am aware of the previous use of balsam for the purpose of cementing together lenses, and also of securing microscopic objects, and I therefore lay claim to no such use.

But what I do claim, is, the application of the balsam to the surface of photographic pictures upon glass, in combination with the method described of protecting and securing the same by means of the additional plate of glass.—*Report of Patent Inventions, April, 1855. Journ. Franklin Inst., Sept., 1855.*

IMPROVEMENTS IN THE TREATMENT OF CERTAIN BITUMINOUS MINERAL SUBSTANCES, AND IN OBTAINING PRODUCTS THEREFROM. By JAMES YOUNG, of Manchester. Patent dated October 17, 1850.

This invention consists in treating bituminous coal in such manner as to obtain therefrom an oil containing parafine (which the patentee calls parafine oil,) and from which oil parafine is obtained. The coals best fitted for this purpose are such as are usually called parrot coal, cannel coal, and gas coal, and which are much used in the manufacture of gas for the purpose of illumination, because they yield, upon distillation at a high temperature, olefiant and other highly illuminating gases in considerable

quantity ; and although some of the coals last described contain a large amount of earthy matters, those matters do not interfere materially with the performance of this process. To obtain paraffine oil from coals, the following is the method of procedure :— The coals are to be broken into small pieces, and are then to be put into a common gas retort, to which is attached a worm pipe passing through a refrigerator, and kept at a temperature of about 55° Fahr. by a stream of cold water. The temperature of the refrigerator should not be made too low, lest the product of the distillation should congeal and stop up the pipe. The retort being closed in the usual manner, is then to be gradually heated up to a low red heat, at which it is to be kept until volatile products cease to come off. Care must be taken to keep the temperature of the retort from rising above that of a low red heat, so as to prevent as much as possible the desired products of the process being converted into permanent gas. The coke or residue may then be withdrawn from the retort, which, being allowed to cool down below a visible red heat (to prevent waste of the fresh material to be introduced,) may be again charged with a quantity of coals to be treated in the like manner. The crude paraffine oil distilled or driven off from the coals as a vapor, will be condensed into a liquid in passing through the cold worm-pipe, from which it will fall into a vessel which must be provided to receive it. Instead of obtaining the whole of the paraffine oil by distillation, a portion of it may, in some cases, if thought desirable, be run from the retort (through an opening and a pipe provided in the anterior and lower part of the retort for that purpose) after it has separated from the coal and assumed a liquid form. The patentee prefers, however, in every case to distil or drive off the whole of the paraffine oil to be obtained from the coal. The production of the desired products from a charge of coals in a retort will be known to be finished by the liquid ceasing to run from the worm. The crude product of this process is an oil containing paraffine, which the patentee calls paraffine oil. This oil will sometimes, upon cooling to a temperature of about 40° Fahr., deposit paraffine. Other arrangements of apparatus may be used for subjecting coals to the process for obtaining paraffine oil therefrom, but that above mentioned is preferred as being well known and easily managed. But in

order to obtain the largest quantity of crude paraffine oil from coals by means of this process, and produce the smallest quantity of permanent gas by the action of the heat employed, whatever may be the apparatus used, care must be taken to heat the coals gradually, and to apply the lowest temperature necessary to complete the operation. During the distillation or driving off, a permanent gas will be produced, and this gas may either be collected or suffered to escape, as may be thought expedient. The crude oil obtained, as already described, is purified in the following manner:—I put the oil into a cistern, and heat it (by a steam pipe or other means) to a temperature of about 150° Fahr. When thus treated, water and undissolved impurities contained in the oil will separate more readily from it than when cold, and the oil being left in a state of rest and kept warm for about a day, many of those impurities will fall to the bottom of the cistern, and the oil may then be run off into another vessel, leaving the residuum behind. For distilling the oil the inventor prefers to use an iron still with a worm-pipe connected to it, passing through a refrigeratory apparatus, which is kept at or about the temperature of 55° Fahr., as already mentioned. The still is heated by a fire underneath it, which is kept up until the whole of the oil has been distilled over, and it will then be found that the still contains some dry carbonaceous residuum, which should be taken out before the still is again used. The oil is to be run from the condensing apparatus as it distils over into a leaden vessel, where, to each 100 gallons there are gradually added 10 gallons of the oil of vitriol of commerce. After this mixture has been well stirred for about an hour, it is to remain at rest for about twelve hours, so that the oil of vitriol and the impurities with which it has combined may settle at the bottom. The supernatant oil is then drawn off into another vessel, and four gallons of a solution of caustic soda, of a specific gravity 1.300 (water being 1.000,) added to each 100 gallons. The soda and oil are stirred together for about an hour, so as to neutralize any acid which may remain in the oil, and also take up any impurities capable of combining with it, after which the contents of the vessel are allowed to remain at rest for about six or eight hours, so that the solution of soda may subside, and then the supernatant oil is to be drawn off, and again distilled in the same

manner as already described. Parafine oil obtained from the last mentioned distillation contains a fluid more volatile than parafine, a considerable portion of which may be separated from the oil and obtained in a separate state as follows:—The oil is placed in an iron still connected with a worm-pipe passing through a refrigeratory apparatus, and half its bulk of water being added, the contents of the still are boiled for about twelve hours, adding water from time to time, so as to keep about the same proportions of oil and water in the still.

The volatile fluid will pas over along with steam, and be condensed in the worm-pipe by the refrigeratory apparatus. This fluid will be clear and transparent, and as it is lighter than water, it separates, on standing, from the water with which it will be mixed as it leaves the worm-pipe of the still. This fluid may be burnt for the purpose of illumination, or applied to any other useful purpose to which it may be applicable. The last-named process will separate the greater portion of the volatile fluid from the oil, but a larger quantity may be separated by prolonging the operation. The oil left in the still after the completion of the process is then to be carefully separated from all the remaining water (upon which it will float) and conveyed into a leaden vessel, where two gallons of oil of vitriol are to be added to each 100 gallons. This mixture is to be well stirred for six or eight hours, after which it is allowed to stand undisturbed for twenty-four hours, in order that the vitriol may settle to the bottom of the leaden vessel, carrying with it all impurities with which it has combined. The supernatant oil is now to be drawn off into another vessel, and to each 100 gallons there is added 28 lbs. of chalk, ground up with a little water into a tin paste. The oil and chalk are to be well agitated until the oil becomes entirely freed from any trace of sulphurous acid, which may easily be known by heating a little of it in a glass retort, and testing its vapors by moistened blue litmus paper. If the vapors change the color of the litmus paper to red, the oil must be treated with more chalk. This oil is to be kept warm—say at 100° Fahr.—in any convenient vessel, for about a week, to allow impurities to settle, and it is then fit to be used for lubricating purposes, either by itself or mixed with an animal or vegetable oil, or it may be burnt by itself in Argand lamps for the purpose of illu-

mination. To extract parafine from the purified parafine oil, obtained in the manner described, the oil is to be cooled to a low temperature—say to 80° or 40° Fahr.; and the lower the temperature, the larger will be the quantity of parafine separated from the oil. In this way parafine is made to crystallize, when it may be separated from the oil by filtration through woolen or other cloths, and then squeezing it in a powerful press, by which means it will be made sufficiently pure to be employed for lubricating and some other useful purposes. But the parafine may be further purified, if required, by treating it several times, at a temperature of about 160° Fahr., alternately with its own bulk of oil of vitriol and with a similar quantity of a solution of caustic soda (of the specific gravity already mentioned) until the parafine ceases to render the oil of vitriol black. It is then to be washed in a weak solution of soda, and lastly with boiling water, until the water ceases to change the color of red litmus paper. Another method adopted to obtain parafine from parafine oil is, to put the oil into a still, and distil over one-half or more of its contents. The portion then remaining will contain a much larger proportion of parafine than the parafine oil at first put into the still contained; this residue being then distilled over into a separate vessel, and allowed to cool. Parafine may be separated by filtration and squeezing in cloths, and also purified by treatment with oil of vitriol and soda, as before described. Parafine oil from which parafine has been separated, as above described, still contains parafine in solution, and is suitable for lubricating or lighting purposes.—*Mechanics' Magazine*, April, 1851, and *Jour. Franklin Inst.*

ANTIDOTE TO STRYCHNIA.

(Extract of a letter from WM. NICK PINDELL, M. D., of St. Michael's, Talbot County, Maryland, to the Editor.)

The object of this letter is merely to state facts, and through the Journal to have the facts made known, at the same time to obtain through your influence further experiments, either to satisfy or dispel from the minds of some that there is always at hand a "safe" and "sufficient" antidote to the poisonous "strychnia." Will you have the "antidote" tested?

I will now state the experiments of mine own, and the occasion of their having been made.

There were some three or four dogs, nightly frequenting my premises, committing devastations upon anything left exposed. They had continued to worry me until forbearance ceased to be a virtue, and sentence was pronounced: "They shall die." A piece of meat containing "1 grain of strychnia," was placed close beside a jar containing refuse "lard." I sat, watched a dog take, eat the meat, and commence upon the lard. My watch was beside me, and I expected the dog to die; five, ten, fifteen, twenty, thirty minutes passed; still, he did not die. That night, the "lard" having all been eaten, three pieces of meat, upon which the poison had been placed, were dropped in separate places. Next morning, I found three dogs dead. I, that day, tried dog No. 1 with two more grains without the lard, and, in ten minutes, he was dead. There have been nine instances in which the poison was given, and antidote used; in neither one did the dog die. In eleven, without the lard, they all died. The half grain was sufficient to kill. Three grains failed when the antidote was used.

The test has been also used upon cats with the same result. A difference in time of death is made by simply putting it upon *fat* instead of *lean* meat; the latter being over some three minutes sooner than the former.

It is proper to state, that the lard was given in not less than "half pints" up to the one and a half.

What is the action of the lard?

Will you, doctor, have this matter tested fully, and then report through the Journal? The article of strychnia, which I have used, was obtained from my chemists in Baltimore, Coleman & Rogers. I do not know, or am unable to account for the action of the lard. I may now state that I have used the camphor and "failed."

If it be necessary, it will afford me pleasure to report at length of the trials, and then have the public to know of the agent, if it should meet your wishes.—*Amer. Jour. Med. Sci.*

*[NOTE.—In repeating these experiments, should they be corroborated, it would be well to try if olive, and other bland fixed oils, will act in the same manner. It will be much more easily administered. The subject is worthy of attention. One condition of success may be that the poison and antidote shall be taken at the same time, as in the instances quoted such was the

fact. In a recent instance of poisoning by strychnia in New York, a gentleman took about two grains of strychnia in mistake for quinine, mixed with Dover's Powder, and three quarters of an hour elapsed before he suspected the mistake. The remedies administered at once were tannin and emetics of sulph. zinc and copper, the tetanic symptoms having set in before the remedies were given, his jaws being kept apart by wooden wedges. Neither of these agents caused emetics until a current of magnetic electricity was applied in the gastric region. The patient recovered.—*EDITOR AMER. JOUR. PHARM.*]

ASPARAGUS AS A DIURETIC.

By S. J. JEAFFRESON, M. D.

I have used a tincture of asparagus as a diuretic for sixteen or seventeen years, with increasing confidence in its usefulness and efficacy. I have thought it worth the notice of our Association at this particular period, because the time is now approaching at which any gentleman may easily make the experiment of its use. I use the following formula: Take of dried tops of asparagus, five ounces; proof spirit, two pints. Take of fresh tops of asparagus, five pounds. Bruise and press out the juice; evaporate at a low temperature till reduced to one pint, and strain. Lastly, add a pint of rectified spirit. Mr. Baly, chemist, of Warwick, can furnish any person desirous of trying the tincture with a limited supply, and will be happy to make any quantity that may be ordered of him.

The peculiar odor communicated by this substance to the urine, in a remarkably short time, is perhaps as familiar to the laity as the profession. It was this fact first led me to think that asparagus might constitute a valuable adjunct to our list of diuretics; if not indeed by virtue of any specific diuretic quality it possessed, at least by its power of directing other agents of acknowledged diuretic power to the kidneys.

On referring to such authorities as fell in my way, I found that, whilst some mentioned asparagus as a diuretic in general terms, without any specific reference to its medicinal administration, others omitted entirely to notice this plant, and some others denied its diuretic properties entirely. It appeared to me evident that any deductions drawn on this subject had been founded entirely on its effects as an article of food, and not upon any

direct experiments of its medicinal administration. The fallacy and uselessness of such deductions is sufficiently apparent ; upon generalizations so vague, we might have discarded numerous of our best remedies as deleterious, innocuous, or useless.

Suffice it to say that, after some sixteen years' experience, I have found the tincture of asparagus a useful adjunct to our diuretic remedies. In many cases, I have found it possessing direct diuretic properties when taken alone in water ; but, in still more instances, I have found it most useful in promoting the diuretic properties of other drugs, as I conceive, by directing them at once to the kidneys. I have repeatedly in my own practice, as also in consultation, simply added from half a drachm to two drachms of tincture of asparagus to each dose of an unsuccessful diuretic, and found that copious diuresis was the result.

Mr. Baly informs me that the exact loss by weight in drying the plant is eleven parts out of twelve ; in other words, that twelve parts by weight of the fresh shoots are only equal to one part dried. I have not tried the infusion of the dry shoots, but should think them worthy of trial.

The tincture of asparagus presents the advantage of being capable of combination, so far as I know by experience, with every diuretic substance in use, be it from the animal, the vegetable, or the mineral kingdom.—*Assoc. Med. Journ.*, May 11, 1855.

Varieties.

On Perfumery. By SEPTIMUS PIRESSE.

(Continued from page 471.)

PERFUMED SOAP.

The word soap, or sope, from the Greek *sapo*, first occurs in the books of Pliny and Galen, and is, according to Dr. Gregory, derived from the German word *sepe*. Pliny informs us that soap was first discovered by the Gauls, that it was composed of tallow and ashes, and that the German soap was reckoned the best. According to Sismondi, the French historian, a soap-maker was included in the retinue of Charlemagne.

At Pompeii (overwhelmed by an eruption of Vesuvius, A. D. 79,) a soap-boiler's shop with soap in it was discovered during some excavations made there not many years ago. (*Starks' Letters from Italy.*)

From these statements it is evident that the manufacture of soap is of very ancient origin; indeed, Jeremiah figuratively mentions it—"For though thou wash thee with natron and take thee much sope, yet thine iniquity is marked before me." (Jer. ii. 22.)

It would be out of place here to enter into the details of soap-making, because perfumers do not manufacture that substance, but are merely "remelters," to use a trade term. The dyer purchases his dye stuffs from the drysalters already fabricated, and are merely modified under his hands to the various purposes he requires; so with the perfumer, he purchases the various soaps in their raw state from the soap makers, these he mixes by re-melting scents and colors according to the article to be produced.

The primary soaps are divided into hard and soft soaps: the hard soaps contain soda as the base; those which are soft are prepared with potash. These are again divisible into varieties, according to the fatty matter employed in their manufacture, also according to the proportion of alkali. The most important of these to the perfumer is what is termed curd soap, as it forms the basis of all the highly scented soaps. [CURD SOAP is a nearly neutral soap, of pure soda and fine tallow.]

OIL SOAP, as made in England, is an uncolored combination of olive oil and soda, hard, close grain, and contains but little water in combination.

CASTILE SOAP, as imported from Spain, is a similar combination, but is colored by protosulphate of iron. The solution of the salt being added to the soap after it is manufactured, from the presence of alkali, decomposition of the salt takes place, and protoxide of iron is diffused through the soap of its well-known black color, giving the familiar marbled appearance to it. When the soap is cut up into bars and exposed to the air, the protoxide passes by absorption of oxygen into peroxide; hence, a section of a bar of Castile soap shows the outer edge red marbled, while the interior is black marbled. Some Castile soap is not artificially colored, but a similar appearance is produced by the use of a barilla or soda containing sulphuret of the alkaline base, and at other times from the presence of an iron salt.

MARINE SOAP is a cocoa-nut oil soap, of soda, containing a great excess of alkali, and much water combination.

YELLOW SOAP is a soda soap, of tallow, rosin, lard, &c., &c.

PALM SOAP is a soda soap of palm oil, retaining the peculiar odor and color of the oil unchanged. The odoriferous principle of palm oil resembling that from orris-root, can be dissolved out of it by tincturation with alcohol; like ottos generally, it remains intact in the presence of an alkali—hence, soap made of palm oil retains the odor of the oil.

The public require a soap that will not shrink and change shape after they purchase it. It must make a profuse lather during the act of washing. It must not leave the skin rough after using it. It must be either quite inodorous or have a pleasant aroma. None of the above soaps possess all these

qualities in union, and, therefore, to produce such an article is the object of the perfumer in his remelting process.

Prior to the removal of the excise duty upon soap in last year, it was a commercial impossibility for a perfumer to *manufacture* soap, because the law did not allow less than one ton of soap to be made at a time. This law, which, with certain modifications, had been in force since the reign of Charles I., confined the actual manufacture of that article into the hands of a few capitalists. Such law, however, was but of little importance to the perfumer, as a soap-boiling plant and apparatus is not very compatible with a laboratory of flowers; yet, in some exceptional instances, these excise regulations interfered with him; such, for instance, as that in making soft soap of lard and potash; known, when perfumed, as *Crème d' Amande*; or unscented, as Saponaceous Cream, which has, in consequence of that law, been entirely thrown into the hands of our continental neighbors.

FIG SOFT SOAP is a combination of oils, principally olive oil of the commonest kind, with potash.

NAPLES SOFT SOAP is a fish oil (mixed with Lucca oil) and potash, colored brown for the London shavers, retaining, when pure, its unsophisticated "fishy" odor.

The above soaps constitute the real body or base of all the fancy scented soaps as made by the perfumers, which are mixed and remelted according to the following formula:—

The remelting process is exceedingly simple. The bar soap is first cut up into thin slabs, by pressing them against a wire fixed upon the working bench. This cutting wire (piano-wire is the kind) is made taut upon the bench by being attached to two screws. These screws regulate the height of the wire from the bench, and hence the thickness of the slabs from the bars. The soap is cut up into thin slabs, because it would be next to impossible to melt a bar whole, on account of soap being one of the worst conductors of heat.

The melting pan is an iron vessel, of various sizes, capable of holding 28 lbs. to 3 cwt., heated by a steam jacket, or by a water bath. The soap is put into the pan by degrees, or what is in the vernacular called "rounds," that is, the thin slabs are placed perpendicularly all round the side of the pan; a few ounces of water are at the same time introduced, the steam of which assists the melting. The pan being covered up, in about half an hour the soap will have "run down." Another round is then introduced, and so continued every half-hour until the whole "melting" is finished. The more water a soap contains, the easier it is melted; hence a round of marine soap, or of new yellow soap, will run down in half the time that it requires for old soap.

When different soaps are being remelted to form one kind when finished, the various sorts are to be inserted into the pan in alternate rounds, but each round must consist only of one kind to ensure uniformity of condition. As the soap melts, in order to mix it, and to break up lumps, &c., it is from time to time "*crutched*." The "*crutch*" is an instrument or tool for stirring up

the soap; its name is indicative of its form, a long handle with a short cross—an inverted **J**, curved to fit the curve of the pan. When the soaps are all melted, it is then colored, if so required, and then the perfume is added, the whole being thoroughly incorporated with the crutch.

The soap is then turned into the "frame." The frame is a box made in sections, in order that it can be taken to pieces, so that the soap can be cut up when cold; the sections or "lifts" are frequently made of the width of the intended bar of soap.

Two or three days after the soap has been in the frame, it is cool enough to cut into slabs of the size of the lifts or sections of the frame; these slabs are set up edgewise to cool for a day or two more; it is then barred by means of a wire. The lifts of the frame regulate the widths of the bars; the gauge regulates their breadth. The density of the soap being pretty well known, the gauges are made so that the soap cutter can cut up the bars either into fours, sixes, or eights; that is, either into squares of four, six, or eight to the pound weight. Latterly, various mechanical arrangements have been introduced for soap cutting, which in very large establishments, such as those at Marseilles in France, are great economizers of labor, but in England the "wire" is still used.

For making tablet shapes the soap is first cut into squares, and is then put into a mould, and finally under a press—a modification of an ordinary die or coin press. Balls are cut by hand, with the aid of a little tool called a "scoop," made of brass or ivory, being, in fact, a ring-shaped knife. Balls are also made in the press with a mould of appropriate form. The grotesque form and fruit shape are also obtained by the press and appropriate moulds. The fruit-shaped soaps, after leaving the mould, are dipped into melted wax, and are then colored according to artificial fruit-makers' rules.

The variegated colored soaps are produced by adding the various colors, such as smalt and vermillion, previously mixed with water, to the soap in a melted state; these colors are not crutched in, hence the streaky appearance or party color of the soap.

ALMOND SOAP.

This soap, by some persons, "supposed" to be made of "sweet almond oil," and by others to be a mystic combination of sweet and bitter almonds, is in reality constituted thus:—

Finest curd soap	1 cwt.	Otto of almonds	1½ lb.
" oil soap	14 lb.	" cloves	½ lb.
" marine	14 lb.	" carraway	½ lb.

By the time that half the curd soap is melted, the marine soap is to be added; when this is well crutched, then add the oil soap, and finish with the remaining curd. When the whole is well melted, and just before turning it into the frame, crutch in the mixed perfume.

CAMPHOR SOAP.

Curd soap	28 lb.	Camphor	1½ lb.
Otto of rosemary	1½ lb.		

Reduce the camphor to powder by rubbing it in a mortar with the addition of an ounce or more of almond oil, then sift it. When the soap is melted and ready to turn out, add the camphor and rosemary, using the crutch for mixing.

HONEY SOAP.

Best yellow soap	1 cwt.
Fig soft soap	14 lb.
Otto of citronella	1½ lb.

WHITE WINDSOR SOAP.

Curd soap	1 cwt.
Marine soap	21 lb.
Oil soap	14 lb.
Otto of carraway	1½ lb.
“ Thyme	} of each ½ lb.
“ Rosemary	
“ Cassia	} of each ½ lb.
“ Cloves	

FULLER'S EARTH SOAP.

Curd soap	10½ lb.
Marine soap	3½ lb.
Fuller's earth (baked)	14 lb.
Otto of French lavender	2 oz.
“ origanum	1 oz.

BROWN WINDSOR SOAP.

Curd soap	½ cwt.
Marine soap	½ cwt.
Yellow soap	½ cwt.
Oil soap	½ cwt.
Brown coloring (caramel)	½ pint.
Otto of carraway	} each ½ lb.
“ cloves	
“ thyme	
“ cassia	
“ petit grain	
“ French lavender	

SAND SOAP.

Curd soap	7 lb.
Marine soap	7 lb.
Sifted silver sand	28 lb.
Otto of thyme	} each 2 oz.
“ cassia	
“ carraway	
“ French lavender	

The above forms are indicative of the method for perfuming soaps while hot or melted.

All the very highly scented soaps are, however, perfumed cold, the explanation of which must be reserved for our next publication.

The variously-named soaps—from the sublime “Sultana” to the ridiculous “Turtle's Marrow”—we cannot, of course, be expected to notice; the reader may, however, rest himself assured that he has lost nothing by their omission.

The receipts given produce only the finest quality of the article named. Where cheap soaps are required, not much acumen is necessary to discern that by omitting the expensive perfumes, or lessening the quantity, the object desired is attained. Still lower qualities of scented soap are made by using greater proportions of yellow soap, and employing a very common curd, omitting the oil soap altogether.

In the last number of the “Annals” the methods explained of scenting soap involved the necessity of melting it. The high temperature of the soap under these circumstances involves the obvious loss of a great deal of perfume by evaporation. With very highly-scented soaps, and with perfume of an expensive character, the loss of ottos is too great to be borne in a commercial sense; hence the adoption of the plan of

SCENTING SOAPS COLD.

This method is exceedingly convenient and economical for scenting small batches, involving merely mechanical labor, the tools required being simply an ordinary carpenter's plane, and a good marble mortar, and lignum vitæ pestle.

The woodwork of the plane must be fashioned at each end, so that when placed over the mortar, it remains firm and not easily moved by the parallel pressure of the soap against its projecting blade.

To commence operations we take first 7 lbs., 14 lbs., or 21 lbs., of the bars of the soap that it is intended to perfume. The plane is now laid upside down across the top of the mortar.

Things being thus arranged, the whole of the soap is to be pushed across the plane until it is all reduced into fine shavings. Like the French charbonnier, who does not saw the wood, but woods the saw, so it will be perceived that in this process we do not plane the soap, but that we soap the plane, the shavings of which fall lightly into the mortar as quickly as produced.

Soap, as generally received from the maker, is in proper condition for thus working; but if it has been in stock any time it becomes too hard, and must have from one to three ounces of distilled water sprinkled in the shaving for every pound of soap employed, and must lay for at least twenty-four hours to be absorbed before the perfume is added.

When it is determined what size the cakes of soap are to be, what they are to sell for, and what it is intended they should cost, then the maker can measure out his perfume.

In a general way, soaps scented in this way retail from 4s. to 10s. per pound—bearing about 100 per cent. profit, which is not too much, considering their limited sale. The soap being in a proper physical condition with regard to moisture, &c., is now to have the perfume well stirred into it. The pestle is then set to work for the process of incorporation. After a couple of hours of "warm exercise" the soap is generally expected to be free from streaks, and to be one uniform consistency.

For perfuming soap in large portions by the cold process, instead of using the pestle and mortar as an incorporator, it is more convenient and economical to employ a mill similar in construction to a cake chocolate-mill, or a flake cocoa-mill; any mechanical apparatus that answers for mixing paste and crushing lumps will serve pretty well for blending soap together.

Before going into the mill, the soap is to be reduced to shavings and have the scent and color stirred in; after leaving it the flakes or ribbons of soap are to be finally bound together by the pestle and mortar into one solid mass; it is then weighed out in quantities for the tablets required, and moulded by the hand into egg-shaped masses, each piece being left in this condition, separately laid in rows on a sheet of white paper, dries sufficiently in a day or so to be fit for the press; the press is the same as that previously mentioned. It is usual before placing the cakes of soap in the press to dust them over with a little starch powder, or else to very slightly oil the mould; either of these plans prevents the soap from adhering to the letters or embossed work of the mould—a condition essential for turning out a clean well-struck tablet.

The body of all the fine soaps mentioned below should consist of the finest

and whitest curd soap, or of a soap previously melted and colored to the required shade, thus:—

ROSE-COLORED SOAP is curd soap stained with vermillion, ground in water, thoroughly incorporated when the soap is melted and not very hot.

GREEN SOAP is a mixture of palm oil soap and curd soap, to which is added powdered smalt ground with water.

BLUE SOAP, curd soap colored with smalt.

BROWN SOAP, curd soap with caramel—i. e., burnt sugar.

The intensity of color varies, of course, with the quantity of coloring.

Some kinds of soap receive or become colored to a sufficient extent by the mere addition of the ottos used for scenting, such as "spermaceti soap," "lemon soap," &c., which become of a beautiful pale lemon color by the mere mixing of the perfume with the curd soap.

OTTO OF ROSE SOAP.

(To retail 10s. per pound.)

Curd soap (previously colored with vermillion)	4½ lb.	Spirituous extract of musk	2 oz.
Otto of rose	1 oz.	Otto of santal	½ oz.
		" geranium	½ oz.

Mix the perfumes, stir them in the soap shavings, and beat together.

TONQUIN MUSK SOAP.

Pale brown colored curd soap	5 lb.	Otto of bergamot	1 oz.
Grain musk	½ oz.		

Rub the musk with the bergamot, then add it to the soap and beat up.

ORANGE FLOWER SOAP.

Curd soap	7 lb.
Otto of neroly	3½ oz.

SANTAL WOOD SOAP.

Curd soap	7 lb.
Otto of santal	7 oz.
" bergamot	2 oz.

SPERMACETI SOAP.

Curd soap	14 lb.
Otto of bergamot	2½ lb.
" lemon	½ lb.

PATCHOULY SOAP.

Curd soap	4½ lb.
Otto of patchouly	1 oz.
" santal	} of each ½ oz.
" vitivert	

FRANGIPANNE SOAP.

Curd soap (previously colored light brown)	7 lb.
Civet	½ oz.
Otto of neroly	½ oz.
" santal	1½ oz.
" rose	½ oz.
" vitivert	½ oz.

Rub the civet with the various ottos, and beat in the usual manner.

CITRON SOAP.

Curd soap	6 lb.
Otto of citron	½ lb.
" verbena (lemon grass)	½ oz.
" bergamot	4 oz.
" lemon	2 oz.

One of the best of fancy soaps that is made.

SAPONACEOUS CREAM OF ALMONDS.

The preparation sold under this title is a potash soft soap of lard. It has a beautiful pearly appearance, and has met with extensive demand as a shaving soap, being also used in the manufacture of EMULSIONS. It is an article of no inconsiderable consumption by the perfumer; it is made thus:—

Clarified lard	7 lb.	Rectified spirit	3 oz.
Potash of ley, (containing 26 per cent. of caustic potash)	3½ lb.	Otto of almonds	2 dr.

Manipulation.—Melt the lard in a porcelain vessel by a salt water bath, or

by a steam heat under 15 lb. pressure; then run in the ley *very slowly*, agitating the whole time; when about half the ley is in, the mixture begins to curdle; it will, however, become so firm that it cannot be stirred. The crême is then finished, but it is not pearly; it will, however, assume that appearance by long trituration in a mortar, gradually adding the alcohol, in which has been dissolved the perfume.

SOAP POWDERS.

These preparations are sold sometimes as a dentifrice and at others for shaving; they are made by reducing the soap into shavings by a plane, then thoroughly drying them in a warm situation, afterwards grinding in a mill, then perfuming with any otto desired.

RYPHAGON SOAP.

Best yellow soap	} equal parts melted together.
Fig soft soap	

Perfumed with anise and citronella.

AMBROSIAL CREAM.

Color the grease very strongly with alkanet root, then proceed as for the manufacture of saponaceous cream.

Perfume Oringeat.

TRANSPARENT SOFT SOAP.

Solution caustic potash (<i>Lond.</i>	| Olive oil 1 lb.
<i>Ph.</i>) 6 lb.	
	| Perfume to taste.

Before commencing to make the soap, reduce the potash ley to one-half its bulk by continued boiling. Now proceed as for the manufacture of saponaceous cream. After standing a few days, pour off the waste liquor.

TRANSPARENT HARD SOAP.

Reduce the soap to shaving, and dry them as much as possible, then dissolve in alcohol, using as little spirit as will effect the solution, then color and perfume as desired, and cast the product in appropriate moulds; finally dry in a warm situation.

Until the Legislature allows spirit to be used for manufacturing purposes free of duty, we cannot compete with our neighbors in this article.

Tamarinds Grown among us.—The New England Farmer says the tamarind has been grown in Virginia from seeds, and is highly spoken of as promising to be a valuable acquisition to our fruit trees, especially on the prairie lands of the West. Its growth is perfectly free from blight and from the depredations of insects. Last season the trees in Virginia produced fruit as good as the imported.—*Med. Counsellor.*

Addition of tannate of Lead to Adhesive Plaster. M. Herpin states that his own experience teaches him that Baynton's treatment, by strapping, may be extended to every breach of surface, whether resulting from wound or ulcer; and the only inconvenience he has found attending it is, the pro-

duction of eczematous eruptions, or vesications in irritable skins. After having tried many means of obviating this, he remembered the great advantage that accrued from the treatment of bed-sores, by means of plasters, powdered with the *tannate of lead*. He caused some of this substance to be combined with adhesive plaster, which henceforth produced no irritation. As the addition of the tannate diminishes the adhesiveness, the proportion may vary accordingly, as this quality is desired or not. It is retained when 1-20th of the tannate is added, and when not much required the proportion may be raised to 1-12th.—*Med. Times and Gaz.*, April 7.

Minutes of the College.

At a stated meeting of the College held at the Hall, September 24th, 1855. Vice President S. F. Troth in the chair. The minutes of the last stated meeting were adopted. The minutes of the Board of Trustees were read by A. B. Taylor, its Secretary. They inform that Lewis M. Emanuel and Herman Leuchsening have been duly elected resident members.

The following Report was read and accepted :—

To the Philadelphia College of Pharmacy.

The Delegates appointed to attend the meeting of the American Pharmaceutical Association, held at New York, on the 11th, 12th and 13th of the present month, report, that previous to the time of meeting, Alfred B. Taylor, one of their number, being unable to leave home, resigned in favor of Samuel S. Garrigues. Henry C. Blair, who had made arrangements to be present, was prevented from accomplishing his will by indisposition.

At the appointed time the meeting was held in the Hall of the New York Medical College, provided for the occasion by the N. Y. College of Pharmacy, and was attended by delegates from the Colleges of Pharmacy at Boston, New York, Philadelphia, Baltimore, and Cincinnati, and from the Memphis (Tenn.) Pharmaceutical Association, and by gentlemen from Maine, Vermont, Michigan, New Jersey, Massachusetts, New York and Louisiana not delegated. The permanent officers of the Association elected on the occasion are—*President*, John Meakim, of New York; *Vice-Presidents*, C. B. Guthrie, of Memphis, Tennessee; Charles Ellis, of Philadelphia, and Henry F. Fish, of Waterbury, Connecticut. *Treasurer*, James S. Aspinwall, of New York. *Recording Secretary*, W. J. M. Gordon, of Cincinnati. *Corresponding Secretary*, W. Procter, Jr., of Philadelphia; and *Executive Committee*, G. D. Coggeshall, of New York, A. J. Matthews, of Buffalo, and W. Procter, Jr., of Philadelphia.

The principal subjects that engaged the attention of the meeting were, the Drug Law and its working, Home Adulteration, Legislation in reference to Poisons, Modification of the Constitution, etc. Several essays were read, one of which, on the Wine Culture of the Ohio Valley, possessed more than ordinary interest. As a full abstract of the Proceedings will be published in the November number of our Journal, the Committee deem it unnecessary to go further into detail in this report than to say, that the meeting was marked with

good feeling, and that the Association adjourned to meet in Baltimore on the 2d Tuesday of September, 1856.

WILLIAM PROCTER, JR., CHARLES ELLIS,
EDWARD PARRISH, SAMUEL S. GARRIGUES.

The Committee on Latin Labels made a verbal report, that the labels authorized to be printed by the College at its last meeting, were now being executed to satisfaction.

The Committee appointed to act in conjunction with the Hall Committee in regard to the repairs to the building, not having found it advisable to proceed with the undertaking, the following was offered by Prof. Bridges and adopted :—

Whereas, The Committee on Repairs have reported, that they can at present use only part of the amount placed at their disposal at the last meeting, therefore,

Resolved, That the Sinking Fund Committee be authorized to purchase two shares of the College Loan.

The Corresponding Secretary introduced and read letters from Michael Donovan, dated Dublin, March 23d, acknowledging the receipt of his Certificate of Honorary membership, also one from Jacob Bell, Esq., dated London, June 13th, in answer to his notification of election to Honorary membership, also one of similar import from Professor T. Redwood, dated London, July 3d, 1855.

On motion of Prof. Thomas, the following was adopted :—

Resolved, That a Committee of three be appointed to report annually the deaths of members of the College, with such biographical notices as may be appropriate. E. Parrish, W. Procter, Jr., and H. C. Blair, were appointed said Committee.

The subject of the republication of the Constitution and By-Laws of the College being introduced, it was moved to authorize a Committee to publish them as they stand ; this motion was not adopted, and the following offered by Prof. Procter as a substitute, was unanimously approved :—

Resolved, That a new edition of the Constitution and By-Laws be printed, and in as much as several of the present By-Laws are obsolete and inoperative, that a Committee be instructed to report to an adjourned meeting, to be held on the 26th of November, such alterations as they may think best, together with all alterations and additions adopted since the last edition was published, the whole to be compiled and prepared for publication.

S. F. Troth, E. Parrish, and A. B. Taylor, were appointed said Committee.

The semi-annual election for eight Trustees was held, and resulted in the choice of the following :—

T. P. James,	W. J. Jenks,	A. B. Taylor,	C. Bullock,
H. C. Blair,	J. L. Smith,	E. T. Ellis,	S. S. Garrigues.

Then adjourned. EDWARD PARRISH, *Secretary*.

Editorial Department.

AMERICAN PHARMACEUTICAL ASSOCIATION.—Our readers will find at page 481 an account of the last meeting of the Association. We regret that so little zeal was manifested by the brethren in not making it convenient to attend the sittings. To remedy this apathy, it will be necessary to annually appoint a committee to report on the best means of applying pharmaceutical knowledge to the production of wealth, which, if duly announced, we doubt not, would bring a numerous attendance, at least of listeners. The strangers present owe their New York friends many thanks for the very elegant supper provided on Wednesday evening, the 12th of September, at the Collamore House, which was honored by several prominent members of the medical profession, and enlivened by Dr. Smith of the press. The official Proceedings of the Association will soon be published by the Chairman of the Executive Committee, George D. Coggeshall, Esq., at New York.

THE VALLEY OF NEW LEBANON (N. Y.) AS A SOURCE OF MEDICINAL PLANTS.—A few days previous to the meeting of the American Pharmaceutical Association, having determined to take a little relaxation, we directed our course up the Hudson, towards the verdant hills of Columbia county in the Empire State, where, beautifully located in the centre of a rich and productive valley, lies the village of New Lebanon. All the way from Hudson the surface is deeply indented with vallies, and the intervening hills gradually increase in volume as you proceed eastward, until they join those of the county of Berkshire, in western Massachusetts. The Lebanon valley, at the point occupied by the village, has a somewhat triangular shape, the eastern angle being the location of the far famed "Lebanon Springs," whilst on the western exposure of the eastern range of hills, on a natural terrace, rise the plain and substantial buildings of the people called Shakers, which completely overlook the village at the height of two hundred feet above it, distant a mile. The soil of this region, although very stony above the alluvial, has great strength, as is evident by the culture of the hill sides, often to the very top, and we remember standing in the midst of a rye field, 800 feet above the village, and viewing the blue ranges of the distant Knatskill; whilst in the east, the Green mountains of Vermont and Massachusetts stretch from north to south. The chief attraction to this district for the general traveller is "the Springs," but the pharmacist naturally inquires for the sources of those numerous packages of roots, herbs, and extracts which annually flow in commerce over the country, duly labelled "New Lebanon."

It was our good fortune to find Mr. H. A. Tilden at his laboratory,* now known all over our country as the source of the best medicinal extracts prepared in vacuo. His business of preparing extracts, has grown so considerably that, at this time, more than twenty thousand pounds of medicinal extracts are annually manufactured, besides a much larger amount of ex-

* See plate at page 576.

tract of liquorice, made from the imported root. The gardens supplying the plants for a part of this large production are located around the laboratory, in the rich alluvial bottom, which, notwithstanding its great fertility, requires to be manured heavily for the narcotic plants, especially for *Hyoscyamus* and *Belladonna*. The *Conium*, has become so extensively naturalized, that nearly all that is used, many tons in amount, is of spontaneous growth. One of the heaviest items in the list of extracts, is that of *Taraxacum*, of which root a large amount is cultivated. Much of this extract being employed by nostrum makers, for hepatic and some other diseases.

A branch of operations, recently entered upon by Mr. Tilden, is the preparation, on a large scale, of fluid extracts, of which a great variety are made to meet the demand occasioned by the extensive adoption by physicians of this form of medicine. The vacuum apparatus, used in the preparation of solid extracts, and which was described by us on a former occasion, (see vol. xx. iii. page, 389) is employed for concentrating the liquids for these with the greatest advantage, without contact of air, and at a low temperature. Notwithstanding the numerous calls on his attention, by the various employees in the works and gardens, Mr. Tilden found time to render our visit in his interesting family extremely pleasant, and to make us acquainted with the neighborhood, by several excursions to the surrounding mountains.

Whilst in the valley, we determined to avail ourselves of an invitation from Mr. Edward Fowler, one of the chief men in the Shaker community, to visit their laboratory, drying-room and gardens, and though not so fortunate as to find him at home, the disappointment was compensated for by the politeness of several other members of the Society, Jonathan Wood, Benjamin Gates and James Long; the two last having charge of the laboratory and herb department. The latter is a building several stories high, the upper rooms employed as a store house. The vacuum apparatus formerly in this building, has been removed to another, where they have provided a steam engine as the source of power for the air pump, in lieu of the old arrangement of a column of falling water, which was not found to answer. The excess of power is used to drive their pugging mill, (a large pair of stone chasers) for crushing green herbs, previously to expressing their juice, besides various powdering apparatus. Their arrangement for displacement with alcohol is continuous, the tincture, as it passes from the percolator beneath, is conveyed to the evaporators, and the condensed vapor conveyed by another channel to the superior end of the percolator to again exert its solvent action, on the principle of Mohr's ether displacing apparatus. The quality of the extracts made here, has much improved since the introduction of the vacuum pan, although they yet unfortunately adhere to the old plan of having two qualities of narcotic and some other extracts; one from the expressed juice, the other by treating the residue from the press with boiling water and evaporating. This arises from the demand for low priced extracts, by parties using them in nostrums. It would be

better policy to make only the best preparations, and then no risk would be run of losing reputation. Their style of putting up extracts has been greatly improved, and in this as well as in the more important feature—their preparation—we can see the excellent effects of a healthy competition with the Messrs. Tilden, who take the lead in the American enterprise of *vacuum extracts*.

Among other uses of the refuse vegetable matter from the press, is that of spreading it around the bases of the trunks of their fruit trees, with, they think, good effects. We visited the garden for culinary vegetables and aromatic plants, and also the orchards for plum, pear and apple trees, which appear to thrive luxuriantly, as we can testify to the excellence of their fruit. We also saw and tasted the "Shaker Seedling," a new variety of grape originating here.

Mr. Gates showed us some sugar of milk of his own preparation obtained from the whey of their cheese presses, which they have heretofore thrown away. As they have forty cows, this new branch of production may prove profitable, though they have not yet attempted it on a large scale. These and other things that attracted our attention we should be glad to dwell upon, did space permit, but the length of this notice cautions us to stop, lest we trench too deeply on pages devoted to graver subjects.

"ALDEHYDE" is informed that anonymous strictures are not published in this Journal, and where writers prefer to use a *nom de plume* instead of their own names, they must at least be known to the Editor, who, in case of publication, assumes the responsibility of the remarks until the name of the writer is divulged. We hope he will be able to accomplish what he asserts his ability to perform, and give it to his brethren in our next number under his proper name.

UNITED STATES NAVAL LABORATORY, NEAR NEW YORK.—During the sitting of the American Pharmaceutical Association in the city of New York, we availed ourselves of the opportunity to visit the Government Laboratory, and were courteously received by Dr. Bache, the director of the establishment. Dr. Edward R. Squibb, the assistant director, who has charge of the operative department, politely exhibited to us the several objects of interest, apparatus, etc. under his charge. The Naval laboratory is located in a building erected several years ago, on the grounds of the U. S. Naval Hospital at Green Point, (Long Island,) as a hospital for small pox, and other infectious diseases, but was found too near the main building, and larger than necessary. Before giving our impressions, it may be well to sketch the history of the enterprise. For many years previous to its institution, the medical department of the navy suffered in its usefulness by the irregular quality of its supplies, and the total want of uniformity and fitness of the outfits for the climates and diseases of the stations on which they were to be employed. This arose partially from the contract system of obtaining supplies, and partially owing to the matter being left to irresponsible parties

to execute, who, having different views, necessarily caused great irregularity in this branch of the medical service. The idea of a government laboratory, as a remedy for this difficulty, is by no means new, but the first practical measures towards calling it into existence, were under the superintendence of Dr. Ruschenberger, with whom it was a favorite idea, and who obtained a small appropriation (\$1200), and extended the duties of the apothecary of the Hospital, so as to include the preparation of a number of galenical medicines, (tinctures, etc.,) and some few chemicals, for the use of the U. S. shipping, fitted out at New York.

The laboratory, on its present footing, was established about three years since, by the Navy Department, under the supervision of the Bureau of Medicine and Surgery, at Washington, "as the best means of securing the good quality of the medical stores used in the navy, and of having them put up in a uniform manner, adapted to the objects in view, and the circumstances of variable climate, to which they must be subjected;" and had for its support all the arguments of a conservative character that could be brought in favor of government ship-yards, rope walks, and blacksmith shops. Since its establishment the objects and views contemplated in its origin have been fully carried out under the able direction of Dr. Bache. The resources of this important branch of the public service have been localized and individualized, and the department rendered, in great measure, independent of the competition of individual interests in the quality, quantity, and times of required supplies. Nor have its advantages been limited to its strictly defined boundaries; it is becoming increasingly useful in the detection of adulterations that have so long and so largely been practised in the provisions and clothing, soap and tobacco, supplied to the navy, not to speak of lighthouse oils and sheathing copper. It is an old idea that "it's no harm to cheat uncle Sam," a phrase perhaps originating with smugglers, which has been acted on in too many instances by other parties in contracts with the Government. However bad such rascality is in reference to clothing and provisions it is much worse as regards the medical supplies of the navy. Picture a noble ship passing out the Narrows on a voyage to the African station, freighted with the lives of 600 men in the Government service, and the surgeon upon whom they depend in that sickly climate, provided with a chest of ill assorted and adulterated medicines, furnished by contract. Imagine this ship's company attacked by an epidemic, and the surgeon finds himself almost powerless for want of efficient medicines in proper variety. Where will the blame rest? Where it has always been put, on Providence, instead of on the authorities who attend to the furnishing of supplies. With the present arrangements at the laboratory, every variety of drugs, medicines and chemical substances, adapted to the several great naval stations can be, and are, constantly being put up in forms and quantities calculated to meet all the changes of circumstances that a voyage presents. The establishment is not a mere chemical laboratory, nor an apothecary shop, nor a drug store; it is a union of these in so far as the wants of the navy require; all the materials being subjected to scrutiny before they

are manufactured in the laboratory, or put up in packages for surgeon's use ; and being located adjacent to the greatest drug mart of the country, the director is enabled to lay in the crude supplies on favorable terms and with the least delay.

The laboratory building is a substantial structure, in shape a parallelogram, and three stories high. The laboratory, properly speaking, is in the basement, one half of which is devoted to the operating room for furnace operations, solutions, distillations, evaporations, etc. We observed very complete arrangements for heating by steam and by gas, and percolating apparatus on a large scale worked with a nicety not noticed before. Adjacent to the steam engine is the powdering room, where drugs are subjected to the various degrees of comminution requisite for use *per se*, or extraction. It is the custom to garble them carefully, which, as it is carried out without fear of "injuring the profits," adds very materially to the efficacy of the resulting powders. In a smaller apartment above, and beyond the influence of the vapor of the laboratory room, the assistant director has his private operating room, conveniently furnished with balances gas furnace, blow-pipes, etc., etc., for performing the numerous analyses and testings required of him as well in pursuance of his legitimate duties as for other branches of the naval service. In the second story is the "store room," where medicines are kept ready for distribution at a short notice, put up in bottles and canisters of a uniform size and shape, made expressly for naval use and adapted to the chests, which, all emanating from this establishment, they fit in without loss of space. This systematizing applies not merely to the packing of medicines, but to the surgical instruments, splints, and other articles, which, heretofore obtained from various sources, present the most unlike shapes, sizes, and qualities, though intended for the same purposes ; and often without any adaptation for packing in a small compass. Now, the chests of instruments are compact, uniform and well selected, contrasting favorably with the collection of obsolete appliances and instruments which, we observed, have accumulated as useless in one of the apartments.

The scope of the laboratory embraces all the preparations of the United States Pharmacopoeia, with the single exception of sulphate of quinia, and some that are not there included, and is governed by that authority in regard to standards of strength and quality ; but in reference to the processes used, they are, as in ordinary manufacturing laboratories, the result in a great degree, of its own experience, especially as regards mechanical contrivances. Should this laboratory go on increasing in experience and scope, so as to include both the army and navy in its supplies, and be conducted on the plan it is at present, it will be highly creditable to the general government, and prove of incalculable advantage to both branches of the service in case of war calling for increased supplies. The laboratory at present furnishes the medical stores for about 8000 men and two thousand officers in the navy, besides keeping up a supply at several depots, to meet any sudden demand ; and has been established sufficiently long to prove itself to be a measure of absolute economy in expenditure.

POLYTECHNIC COLLEGE.—We have received the Third Annual Announcement of the Polytechnic College of the State of Pennsylvania from the President of the Faculty. According to its showing, the Institution, though so recently established, is in a flourishing condition; all the Professorships are filled by individuals qualified for their responsible duties. Thirty-four Matriculants attended the last term. The five courses taught under the general heads, "Civil Engineering," "Mechanical Engineering," Chemistry, general and applied," "Mining Engineering" and "Agriculture," pass into each other on various subjects; no one individual attending all of them. From the synopsis of the courses, the tuition must be very thorough, and eminently calculated to develop the talents of young men, and fit them for the active duties of life, whether scientific, industrial, or mercantile. Those of our readers who may desire further information in regard to the Polytechnic College, should address a letter to Dr. Alfred L. Kennedy, President of the Faculty, No. 268 South Eleventh Street.

ON THE CHEAPER ALKALOIDS OF THE CINCHONAS.—Under this title we have read a pamphlet of sixteen pages, written by Daniel B. Smith, Esq. of Philadelphia, at the request of Messrs. Powers & Weightman, by whom it is circulated gratuitously. The object of the pamphlet is to show, from the testimony of eminent physicians, that cinchonina, quinidia and the alkaloidal matter known in commerce as quinoidine, possess antiperiodic and febrifugal power, to an extent which, if not quite equal to quinia, are so nearly equivalent to it as to demand the serious attention of medical men in an economical point of view. The price of sulphate of quinia has now gone up from the immense demand for it in our Western States, to above three dollars the ounce, whilst sulphate of cinchonina can be purchased for from 70 to 80 cents, and quinoidine much less. From the published experiments of Dr. Pepper and others, in reference to the therapeutic power of the sulphates of cinchonina and quinidia, these salts are considered so nearly equivalent to sulphate of quinia, that in the practice of the Pennsylvania Hospital they are used indiscriminately, whilst Dr. Da Costa's trials with quinoidin in 53 cases, convinced him that it is about three-fifths as strong in curative power as the quinia salt. Further, Prof. R. P. Thomas, of the Philadelphia College of Pharmacy, has, for some months past, been using the cinchonina salt in his own practice, and in that of two institutions with which he is connected, besides inducing several of his friends to employ it regularly, and the result is that he is quite convinced of its efficacy being equal to that of the quinia salt. As a large number of the cases requiring these agents are among the poor, it is of great importance that medical men should consult the interest of these by prescribing the sulphate of cinchonina.

AN INTRODUCTION TO PRACTICAL PHARMACY, *designed as a Text-book for the Student, and as a guide to the Physician and Pharmaceutist, with many formulæ and numerous illustrations.* By EDWARD PARRISH. Philadelphia: Blanchard & Lea, pp. (about) 500 octavo. 1855.

Since the publication of the American edition of Mohr and Redwood's Practical Pharmacy, no special work has appeared on this subject in the English language. The announcement, therefore, that a new treatise on Practical Pharmacy is about to issue from the American press, is calculated to attract the attention of pharmacutists and lead them to inquire into its character and scope. Although not yet published, an opportunity has been afforded us to examine a large portion of the work in sheets, and we are able to give an outline of its contents for the information of our readers.

It is known to many that the author has for some years past been engaged as a teacher of Practical Pharmacy (both by lectures and practical instruction) to medical students, and, like all who have been thus engaged, he has felt the want of a text-book, as an aid to his pupils. The book before us was commenced with a view to satisfy this want, but in its progress, the author determined to enlarge on his original plan, so as, without claiming for it the fulness of a handbook of Pharmacy, to render it very useful to the strictly pharmaceutical student by its systematic arrangement, as well as to pharmacutists in general, by the body of valuable information introduced from the journals and other sources in reference to new preparations.

The book is in five parts: the *first* is preliminary, and relates to the furniture of the shop and the country physicians' office, to weights, measures and specific gravity, and to a notice of the Pharmacopœia.

The *second* part treats of *Galenical* Pharmacy in fourteen chapters, embracing the collection and dessication of plants, the processes of pulverization, solution, filtration, maceration, infusion and percolation. The various liquid preparations made by these processes are considered in classes, as tinctures, wines, vinegars, infusions, decoctions, etc. In order to condense as much as possible, the author brings forward the *officinal* preparations in tabular form, giving the proportions, prominent medical properties, and doses. This is effected by dividing them into classes based on the proportion of the substances to the menstruum; or the nature of the menstruum. Formulæ for the more important *unofficinal* tinctures are then brought forward with special remarks. This plan is followed throughout the work, with some exceptions; the author relying on the general directions given under the head of each class of medicines, and the manipulations described under each general process, as sufficient to enable the student to understand the tabulated formulæ.

The apparatus for generating heat, and the modes of applying it, are considered as a preliminary to the process of evaporation, and the preparation

of extracts and syrups. In treating of the arrangements for heating, the author confines his remarks and illustrations almost entirely to alcohol lamps and gas burners, referring to the larger works for information on furnaces and furnace operations. The remarks relative to the preparation of decoctions and extracts are judicious. After the tabulated formulæ several unofficial extracts, as those of Ignatia Amara, Lupulin, Cimicifuga, Ergot, Pareira, Lobelia, etc., are introduced, followed by several of the Eclectic resinoid preparations. A distinct chapter is allotted to the fluid extracts, which, as few are recognised in the pharmacopœia, is mainly occupied with an account of those not official. The chapter on syrups embraces several that are new, among which we notice compound syrups of Carrageen, and of Blackberry root, and syrups of Gillenia and of Frostwort. The fancy syrups for "Mineral Water" have not been overlooked.

Following the syrups the solid saccharine preparations, conserves, electuaries, lozenges, etc., are noticed, with special formulæ for those that are unofficial. The last chapter in "Galenical pharmacy" is headed "Distillation and spirits," and describes the forms of apparatus used in small distillatory operations and the manipulations they require in use, illustrated with numerous figures, as are the preceding chapters on processes, many of which have been executed expressly for this work.

The *third* part is called "The Pharmacy of plants, their products, &c." and is an account of the proximate principles of plants, and the products and preparations derived from, or made with them; commencing with Lignin starch gum and sugar, and ending with the alkaloids; occupying about ninety pages. The limited space devoted to this part makes the notice of most of the principles very brief, and many are merely named, yet by resorting to tabulation the author has been able to present a very considerable array of facts in connection with each numerous class, in a way well adapted to aid the memory of the student. There are exceptions to this brevity, however, as in the notices of collodion, hydrocyanic acid, morphia, quinia etc.

The *fourth* part treats of "Inorganic Pharmaceutical Preparations," under the several heads of acid, alkaline, earthy, non-metallic, and metallic substances used in medicine. This, as might be anticipated, is the least original part of the book; yet without it the work would have been incomplete. The author has limited himself to a succinct description of the preparations and manipulations, without discussing the rationales, or dwelling on their chemistry; in fact the operations of the laboratory are barely intruded on so far as they may be brought within the scope of shop practice, or the physician's office.

The *fifth* and last division is entitled "Extemporaneous Pharmacy," and is, perhaps, in some respects, the most important part of the book, inasmuch as the subject is less commonly treated of in works on Pharmacy in the English language, and is more like the French treatises on "L'Art de Formuler," one of which is familiar to some of our readers in Doryvaut's "Officine." The chapters on prescriptions, the language of prescriptions,

the writing of prescriptions, the art of combining medicines, and the list of examples of prescriptions, are intended more specially for the medical student, but embrace much of interest to the student and practitioner of Pharmacy. On the whole, we have been much pleased with this "Introduction to Practical Pharmacy," and believe it will prove a valuable addition to our pharmaceutical literature, and especially valuable to medical students who aim at learning more of Pharmacy than the ingredients of its formulæ. There are portions of the book obnoxious to criticism, and it is not difficult to point out errors which should have been avoided, and improvements which might have been introduced, but the late period at which the sheets were placed in our hands, and the limited space left in this concluding form, precludes our bringing them to notice, as it equally prevents us from gratifying our readers by giving some examples of the novelties, style, and illustrations of the author, which we hope to be able to do in a future number.

THE BOOK OF PRESCRIPTIONS, containing 2,900 *Prescriptions, collected from the practice of the most eminent Physicians and Surgeons, English and foreign, comprising also a compendious history of the Materia Medica of all countries, alphabetically arranged; and lists of the doses of all officinal or established preparations.* By HENRY BEASLEY, Philadelphia, Lindsay & Blakiston, 1855, pp. 369, 12 mo.

As this book is a reprint from the English, the extemporaneous formulae are mostly those of British, physicians and consequently in many instances have reference to preparations of different strength and composition from those that are employed here. They are clothed in a full Latin garb, and should the work become popular among young Physicians, we may have a return to the now nearly obsolete practice of writing prescriptions with the direction in Latin, (or dog latin) abbreviated in the most approved style. The prescriptions are arranged under the heads of the most prominent drug they contain, which is previously described in a brief manner. After many of the prescriptions the diseases for which they are intended are stated, and in most instances the names of the prescribers. There are, doubtless, many practitioners who will find in this book a substitute for that originality of thought and tact in therapeutics, which is a characteristic of the true Physician, and to these we commend it. As regard the "getting up," the paper, typography and binding are unexceptionable, and highly creditable to the publishers.

Report on the Minerals and Mineral Waters of Chile. By J. LAWRENCE SMITH, Prof. of Chemistry, University of Louisville. 25 pp. 4to.
Memoir on Meteorites. By the same.

We have only space to acknowledge the reception of the above Memoirs from the author, and to observe that the first "report" is on the Minerals, etc., brought from South America by the U. S. Naval Astronomical Expedition sent to Chile several years, since under Lieut. Gillis.

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